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(54) CURABLE COMPOSITION

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a method for improving the restorability, durability and creep resistance of a cured product, and to provide a curable composition capable of giving cured products having excellent restorability, durability and creep resistance.

SOLUTION: This method for improving the restorability, durability and creep resistance of the cured product is characterized by using a curable composition containing an organic polymer (A1) having silicon-containing functional groups capable of cross-linking by forming siloxane bonds, wherein the silicon-containing functional groups capable of cross-linking by forming siloxane bonds are siliconcontaining functional groups having three or more hydrolysable groups on the silicon.

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Claim(s)]

SLAIMS

Stability, endurance, and creep resistance corrective strategy of a hardened material using an organic a silicon containing functional group which can construct a bridge by forming a iloxane bond, and a hardenability constituent containing ailicata (B). t is an organic polymar which has a silicon containing functional group which can construct a bridge nardened material, wherein a silicon containing functional group which can construct a bridge by y forming a siloxane bond, Stability, endurance, and creep resistance corrective strategy of a

forming a alloxane bond uses on allicon a hardenability constituent containing an organic polymer (A1) which is a silloon containing functional group which has three or more hydrolytic bases.

construct a bridge by forming a siloxane bond, Stability, endurance, and creep resistance corrective 4 main chain of an organic polymer (A1) which has a silicon containing functional group which can

strategy of the hardened material according to claim 2 using a hardenability constituent which is an scrylic ester system copolymer manufactured by a living-radical-polymerization method (meta).

Stability, endurance, and creep resistance corrective strategy of the hardened material according to Claim 4

Stability, endurance, and greep resistance corrective strategy of the hardened material according to claim 2 or 3 using a hardenability constituent which contains silicate (B) further.

any one of claims 2 to 4 using a hardenability constituent which contains carboxylic acid tin salt (C) Stability, andurance, and creap resistance corrective strategy of the hardened material according to Claim 6

any one of claims 2 to 5 using a hardenability constituent which contains an organic tin catalyst (D)

t is an organic polymer which has a silicon containing functional group which can construct a bridge nardened material using a hardenability constituent which is an organic polymer (A2) which averages per molecule a silicon containing functional group over which this organic polymer can construct a bridge by forming a siloxane bond, and has it 1.7–5 pieces. by forming a siloxane bond, Stability, endurance, and creep resistance corrective strategy of a

Stability, endurance, and creep resistance corrective strategy of the hardened material according to

siloxane bond uses on silicon a hardenability constituent which is a silicon containing functional group plaim 7, wherein a silicon containing functional group which can construct a bridge by forming a which has three or more hydrolytic bases,

An organic polymer in which an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond introduced an unsaturation group into an end, and general formula (1): nttp://www4.ipdl.knpit.go.jp/cgi-bin/tran.web_cgi-ejje?atw_u=http://www4.ipdl.inpit.go.jp. 2010/04/30

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H-(SIR1 2-b X bO) m-SIR2 3-a X (1)

2, or 3b shows 0, 1, or 2, respectively. About b in m bases (SiR $_{2-b}^{1}X_{b}^{0}$), they may be the same and hydrolytic basis, and when two or more X exists, they may be the same and may differ. As for a, 0, 1, different. When the Torl ORGANO alloxy group shown by aryl group of the carbon numbers 6-20, an an alkyl group of the carbon numbers 1-20 from which R¹ in a formula and R² were the same as or aralkyl group of the carbon numbers 7-20, or (R1) 3SiO- is shown and R1 or two or more R2 exist, numbers 1-20 here, and three R' may be the same and may differ. X shows a hydroxyl group or a they may be the same and may differ. R' is a hydrocarbon group of monovalence of the carbon

may differ. m shows an integer of 0 to 19, however — what satisfies a+sigma b>=1 — carrying out the stability of the hardened material according to claim 1 or 7 using a hardenability constituent which is an organic polymer obtained by an addition reaction with a hydrosilane compound expressed. An organic polymer in which an organic polymer which has a silicon containing functional group which endurance, and creep resistance corrective strategy.

can construct a bridge by forming a siloxane bond introduced an unsaturation group into an end, and a general formula (2):

may differ. Stability, endurance, and creap resistance corrective strategy of a hardened material given In either [Claims 2, 3, 4 and 5 using a hardenability constituent which is an organic polymer obtained (X in a formula shows a hydroxyl group or a hydrolytic basis, and three X may be the same and) It H-SIX, (2)

by an addition reaction with a hydrosilane compound expressed, and] 6 or 8.

It is an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond, and this organic polymer is a general formula (3). :

-O-R3-CH(CH3)-CH2-(SIR1 2-6X 6O) m-SIR2 3-3X 3 (3)

sorts chosen from a group which consists of hydrogen, oxygen, and nitrogen as a composition atom) $(\mathbb{R}^3$ in a formula a divalent organic group of the carbon numbers 1–20 which contain one or more

material using a hardenability constituent which is an organic polymer (A3) which has a structure part show and] R1, R2, X, a, b, and m -- the above -- it is the same -- the stability of a hardened

An organic polymar which has a silicon containing functional group which can construct a bridga by

with which it is expressed, endurance, and creep resistance corrective strategy.

forming a siloxane bond is a general formula (4). : -0-R3-C(CH,) =CH, (4)

An organic polymer which introduced an unsaturation group expressed with (R3 is the same as the 2-bX bO) m-SIR² 3-x x (1) above), and a general formula (1):

Stability, endurance, and creep resistance corrective strategy of the hardened material according to reaction with a hydrosilane compound expressed with (R1 in a formula, R2, X, a, b, and m are the claim 11 using a hardenability constituent which is an organic polymer obtained by an addition same as the above).

An organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond is a general formula (5). : -O-R3-CH(CH3)-CH3-SIX, (5) Claim 13

(R² in a formula and X are the same as the above.) — the stability of the hardened material according to claim 11 or 12 using a hardenability constituent which is an organic polymer which has a structure part with which it is expressed, endurance, and creap realatanca corrective strategy.

An organic polymer which has a silicon containing functional group which can construct a bridga by

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nardenability constituent which is an organic polymer which does not contain an amide segment (orming a siloxane bond, Stability, enduranca, and creep resistance corrective strategy of the serdened material according to any one of claims 1 to 13 using for a principal chain skeleton a

VH-CO-) substantially.

4 silicon containing functional group which can construct a bridge by forming a alloxane bond is a general formula (6). :

three R4 is the organic groups of monovalence of the carbon numbers 2-20 independently among a Si(OR*), (6)

formula, respectively.) — the stability of the hardened material according to any one of claims 1 to 14

using a hardenability constituent which is a basis expressed, endurance, and creep resistance

corrective strategy.

any one of claims 1 to 15, wherein a silicon containing functional group which can construct a bridge Stability, endurance, and creep resistance corrective strategy of the hardened material according to by forming a siloxane bond uses a hardenability constituent which is a triethoxy silyl group. [Claim 17]

it is an organic polymer which has a silicon containing functional group which can construct a bridge polymer (A1) which is a silicon containing functional group which has three or more hydrolytic bases, by forming a siloxane bond. Thin layer hardenability corrective strategy, wherein a silicon containing functional group which can construct a bridge by forming a alloxane bond uses on ailicon an organic and a hardenability constituent containing an organic tin catalyst (D).

finishing adhesives, adhesives for finishing of wall, adhesives for car panels, the electrical and electric An organic polymer (A) which has a silicon containing functional group which can construct a bridge by forming a siloxane bond, And adhesives for interior panels containing silicate (B), Adhesives for face panels, adhesives for tiling adhesives, Floor equipment, an electron and adhesives for precision-mechanical-equipment assemblies, a sealing

is an organic polymer which has a silicon containing functional group which can construct a bridge material for direct grazing, a sealing material for multiple glass, a sealing material for speed signal generator construction methods, or a sealing material for working joint of a building.

containing functional group which has three or more hydrolytic bases on silicon. Adhesives for interior sssemblies, a scaling material for direct grazing, a sealing material for multiple glass, a aealing material orming a siloxane bond, . It is characterized by containing an organic polymer (A1) which is a silicon sanels, adhesives for face panels, adhesives for tiling, adhesives for stone tensions, Cailing finiahing or speed signal generator construction methods, or a saaling material for working joint of a building. electrical and electric equipment, an electron and adhesives for precision-mechanical-equipment by forming a siloxane bond, A silicon containing functional group which can construct a bridge by idhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for car panels, The

adhesives for tiling, adhesives for stone tensions, Ceiling finishing adhesives, floor finishing adhesives, electron and adhesives for precision-mechanical-equipment assemblies, a sealing material for direct grazing, a sealing material for multiple glass, a scaling material for speed signal genorator construction sster system copolymer manufactured by a living-radical-polymerization method (meta) to Claim 19 construct a bridge by forming a siloxane bond, Using a hardenability constituent which is an acrylic A main chain of an organic polymer (A1) which has a silicon containing functional group which can by which it is characterized A description, Adhesives for interior panels, adhesives for face panels, adhesives for finishing of wall, adhesives for car panels, The electrical and electric equipment, an nethods, or a sealing material for working joint of a building

face panela, adheaivaa for tiling, adheaivas for stone tensions, Ceiling finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for car panela, The electrical and electric Slaim 19 containing silicata (B) further or 20 descriptions, Adhesives for interior panels, adhesives for equipment, an electron and adheaivas for precision-mechanical-equipment assemblies, a sealing ttp://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http://www4.ipdl.inpit.go.jp... 2010/04/30

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naterial for direct grazing, a sealing material for multiple glass, a scaling material for speed signal generator construction methods, or a sealing material for working joint of a building. from Claim 19 containing carboxylic acid tin aalt (C) further, to either of 21 A description, Adhesives Ceiling finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for car panels, The electrical and electric equipment, an electron and adhesives for precision-mechanicalsealing material for speed signal generator construction methods, or a sealing material for working equipment assemblies, a sealing material for direct grazing, a sealing material for multiple glass, a for interior panels, adhesives for face panels, adheaves for tiling, adhesives for stone tensions,

From Claim 19 containing an organic tin catalyst (D) further, to either of 22 A description, Adhesives Deiling finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for car panels, The electrical and electric equipment, an electron and adhesives for precision-mechanicalequipment assemblies, a sealing material for direct grazing, a sealing material for multiple glass, a sealing material for speed signal generator construction methods, or a sealing material for working for interior panels, adhesives for face panels, adhesives for tiling, adhesives for stone tensions,

by forming a alloxane bond, . It is characterized by this organic polymer being an organic polymer (A2) t is an organic polymer which has a silicon containing functional group which can construct a bridge which averages per molecule a silicon containing functional group which can construct a bridge by froming a illustrate bond, and has it 11-5 places, debestions for interfor panels, arthurbases for finest panels, defines for the first additional for tenne hashings. Only fillushing statisticals, flow fillushing afterbies, achieves for finishing of wall, subsides for ora panels, the destriction and destrict outpinners, in according to the property of property and probabilistic seasonships, as easiling material for deep grazing, a sealing material for multiple, glass, a sealing material for speed degran. generator construction methods, or a sealing material for working joint of a building.

sealing material for multiple glass, a sealing material for speed signal generator construction methods. A silicon containing functional group which can construct a bridge by forming a siloxane bond, The Claim 24 description being a silicon containing functional group which has three or more hydrolytic adhesives for precision-mechanical-equipment assemblies, a sealing material for direct grazing, a adhesives for stone tensions, Ceiling finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for car panels. The electrical and electric equipment, an electron and bases on silicon, Adhesives for interior panels, adhesives for face panels, adhesives for tiling, or a sealing material for working joint of a building. An organic polymer in which an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond introduced an unsaturation group into an end, and a general formula (1):

That it is an organic polymer obtained by an addition reaction with a hydrosilane compound expressed 2-bX b0) m-SiR² 3-aX a(1)

characterized, or 24 A description, Adhesives for interior panels, adhesives for face panels, adhesives for tiling, adhesives for stone tensions. Ceiling finishing adhesives, floor finishing adhesives, adhesives scaling material for multiple glass, a sealing material for speed signal generator construction methods. for finishing of wall, adhesives for car panels, The electrical and electric equipment, an electron and adhesives for precision-mechanical-equipment assemblies, a sealing material for direct grazing, a with (R1 in a formula, R2, X, a, b, and m are the same as the above) to Claim 18 by which it is or a sealing material for working joint of a building.

An organic polymer in which an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond introduced an unsaturation group into an end, and Reneral formula (2): http://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http://www4.ipdl.inpit.go.jp... 2010/04/30

That it is an organic polymer obtained by an addition reaction with a hydrosilane compound exprassed with (X in a formula is the same as the sbove) to either [Glaima 19, 20, 21 and 22 by which it is adhesives for tiling, adhesives for stone tensions, Calling finishing edhesives, floor finishing adhesives grazing, a sealing material for multiple glass, a scaling material for speed signal generator construction sthesives for finishing of wall, adhosives for car panels. The electrical and electric equipment, an electron and adhesives for precision-mechanical-equipment assemblies, a sealing material for direct charecterized, and] 23 or 25 A description, Adhesives for interior panels, adhesives for face panels.

nethods, or a sealing material for working joint of a building

It is an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond, and this organic polymer is a general formula (3).

It is characterized by being an organic polymer (A3) which has a structure part expressed with (${
m R}^{1}$ O-R3-CH(CH3)-CH2-(SIR1 2-bX bO) m-SIR2 3-aX (3)

seemblies, a sealing material for direct grazing, a sealing material for multiple glass, a seeling material slectrical and electric equipment, an electron and adhesives for precision-mechanical-equipment adhesivas, floor finishing adhesives, adhesives for finishing of wall, adhesives for cer panels, The in a formula, R², R³, X, a. b, and m are the same as the above). Adhesives for interior panels, adhesives for face pancis, adhesives for tiling, adhesives for stone tensions, Ceiling finishing

or speed signal generator construction methods, or a sealing meterial for working joint of a building

An organic polymer which has a silicon containing functional group which can construct a bridge by orming a siloxane bond is a general formule (4). :

0-R1-C(CH2) =CH3 (4)

An organic polymer which introduced an unsaturation group expressed with (R¹ is the same as the ibove), and a general formula (1):

+-(SiR² 2-4 X bO) m-SIR³ 3-2 X (1)

That it is an organic polymer obtained by an addition reaction with a hydrosilane compound expressed iling, adhesives for stone tensions, Ceiling finishing adhesives, floor finishing adhesives, adhesives for sealing material for multiple glass, a soaling material for speed signal generator construction methods, characterized A description, Adhesives for interior panels, adhesives for face panels, adhesives for adhesives for precision-mechanical-equipment assemblies, a sasing matcrial for direct grazing, a inishing of wall, adhesives for car panels. The electrical and elactric equipment, an electron and with (R2 in a formula, R3, X, a, b, and m are the same as the above) to Claim 28 by which it is

An organic polymer which hes a silicon containing functional group which can construct a bridge by or e acaling material for working joint of a building.

forming a siloxane bond is a general formula (5).: O-R1-CH(CH,)-CH,-SIX, (5)

which has a structure part with which it is expressed — being according to claim 28 or 29. Adhesives R in a formula and X are the same as the above.) — it is characterized by being an organic polymer Cailing finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for car panels, The electrical and electric equipment, an electron and adhesives for precision-mechanicalequipment assemblies, a sealing material for direct grazing, a sealing material for multiple glass, a sealing material for speed signal generator construction methods, or a sealing material for working for interior panels, adhesives for face panels, adhesives for tiling, adhesives for stone tensions,

An organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond, From Claim 18 being an organic polymer which dose not contain an amide segment (=NH-CO-) substantielly in a principal chain skaleton, to either of 30 A description, Adhesives for interior panels, edheaives for face panels, adhesives for tiling, edhesives for stone http://www4.ipdl.inpit.go.jp/ogi-bin/tran.web_ogi_ejje?atw_u=http://www4.ipdl.inpit.go.jp... 2010/04/30

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tenations, Calling finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, adabtives for our panies. The electrical and electric aquipment, an electron and adhesives for proteision—mediately and electrical and electrical and electrical proteision—mediately grazing, a sealing material and adversarial for direct grazing, a sealing material and an electrical and protein and adversarial adversarial and adversarial and adversarial and adversarial and adversarial and adversarial and adversarial adversarial adversarial and adversarial and adversarial adversarial and adversarial adversarial adversarial and adversarial adversarial adversarial adversarial adversarial adversarial adversarial and adversarial adversaria for multiple glass, a seeling meterial for speed signal generator construction methods, or a sealing

A silicon containing functional group which can construct a bridge by forming a siloxane bond is a material for working joint of a building. general formula (6). : [Claim 32]

R* in a formula is the same as the above.) — it is characterized by being a basis expressed — being according to any one of claims 18 to 31. Adhesives for interior panels, adhesives for face panels, adhesives, flor finishing adhesives, floor finishing adhesives. - Si(OR*) 3 (6)

grazing, a sealing material for multiple glass, a sealing material for speed signal generator construction adhesives for finishing of wall, adhesives for car panels. The electrical and electric equipment, an electron and adhesives for procision-mechanical-equipment assemblies, a scaling material for direct methods, or a sealing material for working joint of a building

assemblies, a sealing material for direct grazing, a sealing material for multiple glass, a sealing material for speed signal generator construction methods, or a sealing material for working joint of a building A silicon containing functional group which can construct a bridge by forming a siloxane bond, From electrical and electric equipment, an electron and adhesives for precision-mechanical-equipment Claim 18 being a triethoxy silyl group, to either of 32 A description, Adhesives for interior panels, adhesives, floor finishing adhesives, adhesives for finishing of wall. edhesives for car panels, The adhesives for face pencls, adhesives for tiling, adhesives for stone tensions, Ceiling finishing

It is an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond. An organic polymer (A1) whose silicon containing functional group which can construct a bridge by forming a siloxane bond is a silicon containing functional group which has

three or more hydrolytic bases on silicon, and a hardenability constituent containing silicate (B). The hardenability constituent according to claim 34, wherein silicate is a condensate of tetra

alkoxysilane.

Claim 36

It is an organic polymer vahich has a silicon containing functional group which can construct a bridge for forming a silocene book A, silicon containing throstoned group which one construct a bridge forming a silocene bond. An organic polymer (AI) which is a silicon containing functional group which forming a silocene bond. An organic polymer (AI) which is a silicon containing functional group which the silicon containing the silicon of the silicon containing functional group which the silicon containing the silicon of the silicon containing the silicon containing functional group which the silicon of the silicon of the silicon of the silicon containing the silicon containing the silicon of the s hes three or more hydrolytic bases on silicon, and a hardenability constituent containing carboxylio acid tin selt (C1) whose cerbon of en elphe position of a carboxyl group is the 4th class carbon. It is an organio polymer which has a silican containing functional group which can construct a bridge by forming a silicance bond. An openior bother of Alp and cabocylic acid this salt (O) whose silican containing the discusse bond is a silican containing the discusse bond is a silican. containing functional group which has three or more hydrolytic bases on silicon, and a hardonability constituent containing an organic tin catalyst (D). It is an organic polymer which has a silicon containing functional group which can construct a bridge

by forming a siloxane bond, An organic polymer (A1) whose silicon containing functional group which can construct a bridge by forming a siloxane bond is a silicon containing functional group which has three or more hydrolytic bases on silicon, and a hardenability constituent containing a non-tin It is an organic polymer which hes a silioon oontaining functional group which cen construct a bridge by forming a siloxene bond, An organic polymer (A1) whose eilicon containing functional group which oan construct a bridge by forming a alloxane bond is a silloon containing functional group which has three or more hydrolytic bases on silloon, and a hardenability constituent containing a minute hollow http://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http://www4.ipdl.inpit.go.jp... 2010/04/30

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Claim 40

t is an organic polymer which has a silicon containing functional group which can construct a bridga by forming a siloxane bond, A silicon containing functional group which can construct a bridge by

nore hydrolytic bases on silicon and this organic polymer is 5 to 28 % of the weight in a total amount containing an organic polymer (A1) which is a ailicon containing functional group which has three or orming a alloxane bond, A hardenability constituent, wherein it is a hardenability constituent of a hardenability constituent. An organic polymer in which an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond introduced an unsaturation group into an end, and a general formula (2):

The hardenability constituent according to any one of claims 34 to 40 being an organic polymer obtained by an addition reaction with a hydrosilane compound expressed with (X in a formula is the +SiX, (2)

same as the above).

A silicon containing functional group which can construct a bridge by forming a siloxana bond is a Claim 42

general formula (6). :

The hardenability constituent according to any one of claims 34 to 41 being a basis expressed with Si(OR⁴) ₃ (6)

(R4 in a formula is the same as the above). [Claim 43]

A silicon containing functional group which is an organic polymer which has a silicon containing the control group which an constructs a bridge by forming a silocane bond, and can construct a bridge by forming a silocane bond is a general forming in the control of the contro

Si(OR⁴)₃ (6)

An organic polymer (A4) which has a basis expressed with (R4 in a formula is the same as the above),

and a general formula (7): - SIR⁵ (OR⁶) 3-c (7) (c R5 is the organic groups of monovalence of the carbon numbers 1-20 independently among a formula, respectively.)

respectively, and c shows 0, 1, or 2. A hardonability constituent in which storage stability containing 3-c R⁶ is the organic groups of monovalance of the carbon numbers 2-20 independently, an aminosilane coupling agent (G) which has a basis expressed has been improved.

A silicon containing functional group which is an organic polymer which has a silicon containing solicitiestial group which has nonetruche is bridge by forming a silocene bond, and can construct a bridge by forming a locate bond, and can construct a bridge by forming a locate bond is a general forming lot (b): - Si(OR*) 3 (6) An organic polymer (A4) which has a basis expressed with (R4 in a formula is the same as the above),

- SIR7 (OCH3) (OR®) 3-d-a (8) and a general formula (8):

d R7 is the organic groups of monovalence of the carbon numbers 1-20 independently among a formula, respectively.)

It is an organic group of monovalence of the carbon numbers 2-20 independently, and d shows 0, 1, However, 3-d-o>⊐ shall be satisfied. A hardenability constituent in which it is a hardenability constituent containing an aminolaine couping agent (H) which has be base sopressed, and a oure rate recouperating nonself beforehend in this fundenability constituent has been improved. or 2 and, as for R⁸ of a 3-d-e individual, e shows 1, 2, or 3, respectively.

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A silicon containing functional group which is an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond, and can construct a bridge by forming a siloxane bond is a general formula (6). : An organic polymer (A4) which has a basis expressed with (R4 in a formula is the same as the above), and a hardenability constituent containing epoxy resin (I).

A silicon containing functional group which is a polyoxyalkylene series polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond, and can construct a bridge by forming a siloxane bond is a general formula (6).:

A polyoxyalkylene series polymer (A5) which has a basis expressed with (R4 in a formula is the same which has a silicon containing functional group which can construct a bridge by forming a siloxane as the above), And a hardenability constituent containing an acrylic ester system copolymer (A6) - Si(OR*) 3 (6)

A allicon containing functional group which is a saturated hydrocarbon system polymer which has a silicon containing functional group which one construct a bridge by forming a siloxana bond, and can construct a bridge by forming a siloxana bond, and can construct a bridge by forming a siloxana bond is a general formula (6). Claim 47

A hardenability constituent containing a saturated hydrooarbon system polymer (A7) which has a basis expressed with (R4 in a formula is the same as the above). - Si(OR*), (6)

containing functional group which can construct a bridge by forming a siloxane bond (meta), and can A silicon containing functional group which is an acrylic ester system copolymer which has a silicon construct a bridge by forming a siloxane bond is a general formula (6). : Claim 48

a hardenability constituent containing an acrylic ester system copolymer (A8) which has a basis expressed with (R4 in a formula is the same as the above) (meta-). - SI(OR*) 3 (6)

An organic polymer in which an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond introduced an unsaturation group into an end, and a general formula (9): Claim 49]

obtained by an addition reaction with a hydrosilane compound expressed with (being the same as \mathbb{R}^4 The hardenability constituent according to any one of claims 42 to 48 baing an organic polymer above in a formula). H-SI(OR*) 3 (9)

which has a silicon containing functional group which can construct a bridge by forming a silioxane bond is characterized by being an organic polymer which does not contain an amide segment (-NH-The hardenability constituent according to any one of claims 34 to 49 in which an organic polymer CO-) substantially in a principal chain skeleton. Claim 50

The hardenability constituent according to any one of claims 34 to 50, wherein a silicon containing functional group which can construct a bridge by forming a siloxane bond is a triethoxy silyl group. A silicon containing functional group which is an organic polymer which has a silicon containing functional group which can content to bridge by forming a silonane bond, and can construct a bridge by forming a silonane bond, and can construct a bridge by forming a silonane bond, and can construct a bridge

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A general formula (10) carrying out the ester exchange reaction of the compound (J) which has at least one methoxy group which can carry out an ester exchange reaction to an organic polymer (A4)

which has a basis expressed with (R4 in a formula is the same as the above) - Si(OCH₃) (OR⁴) _{3-f} (10)

(3-f R⁴ is the organic groups of monovalence of the carbon numbers 2-20 independently among a formula, networknely.) f shows 1, 2, or 3.4 menufacturing method of an organic polymer which has a basis expressed.

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DETAILED DESCRIPTION

Detailed Description of the Invention] Field of the Invention

This invention relates to the hardenability constituent containing the organic polymer which has a silicon containing functional group (hanceforth a reactive silicon group) which cen construct a bridge Background of the Invention] by forming a siloxane bond.

It is known that the organic polymer which contains at least ona reactiva silicon group in a molecule has tha interesting character in which construct a bridge by formation of the siloxane bond accompanied by the hydrolysis reaction of a reactive silicon group, etc., and a rubber-like hardened

naterial is obtained with hygroscopic surface moisture etc. also in a room temperature.

colyisobutylene system polymer are already produced industrially, and are widely used for uses, such in the polymer which has these reactive silicon groups, a polyoxyalkylene series polymer and a as a scaling material, adhesives, and a paint.

nay pass with prudence and the stress from the outside of adherend, it may change by the time, and and oreep resistance are bad, an edhesivas layor may pass, and it may change by the time, and may be connected with the degradation of apparatus. Therefore, it is called for that the constituent for a panel tile, a stone, etc. may shift. Also in celling finishing adhesives or floor finishing adhesives, if inferior to stability or oresp resistance, an adhesives layer may pass and it may change by the time, walf, the adhesives for car panels, etc. is inferior to stability or orecp resistance, an adhesives layer electric equipment, an electron, and the adhesives for precision-mechanical-equipment assemblies adhesives for stone tensions. When the resin for adhesives used for the adhesives for finishing of and unevenness of a ceiling surface or a floor line may arise. If the stability of the electrical and he adhesives for interior panels, the adhesives for face panels, the adhesives for tiling, the these adhesives is excellent in stability or creep resistance.

used in order to give watertight and airtightness. Therefore, since the flattery nature to the use part A sealing material generally fills up the joined part and cravice between various members, and he is 00051

over a long period of time is very important, excelling in stability or endurance is called for as physical wall, and various face panels — business — stability and endurance excellent in the constituent used for a scaling material for multiple glass, the form a scaling material for multiple glass, the width (Kasagi) the circumference of glass, the circumference of a window frame and a sash, a curtain properties of a hardened material. Working joint of a building with an especially large change of joint sealing material for speed signal generator construction methods, etc. are called for.

documents 7), the (patent documents 8), (The patent documents 9), the (patent documents 10), the (patent documents 11), the (patent documents 12), (The patent documents 13), the (patent documents 14), the (patent documents 15), the (patent documents 17), On the other hand, (the patent documents 1), the (patent documents 2), the (patent documents 3), the (patant documents 4), (The patent documents 5), the (patent documents 6), the (patent

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mainly indicated, and the description which suggests stability, creep resistance, and endurance is not constituent which uses as an essential ingredient the organic polymer which has the reactive silloon group which three hydrolytic bases combined on silloon is indicated, In these advanced technology. the (patent documents 18), the (patent documents 19), the (patent documents 20), in (the patent documents 21), the (patent documents 24), the fast curability based on the reactive silicon group which three hydrolytic bases combined is the (patent documents 25), the (patent documents 26), the (patent documents 27), the (patent documents 28), and the (patent documents 29), Although the room-temperatura-curing natura

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Problem(s) to be Solved by the Invention Patent documents 29] JP.2000-327771,A 0007

Description of the Invantion]

An object in view of the above-mentioned actual condition of this invention is to provide the stability, interior panels with which stability, endurance, and creep resistance have been improved as for this ceiling finishing adhesives, Floor finishing adhesives, the adhesives for finishing of wall, the adhesives invention. The adhesives for face panels, the adhesives for tiling, the adhesives for stone tensions. for car panels, the electrical and electric equipment, an electron and the adhesives for precisionnechanical-equipment assemblies, it aims at providing the sealing material for direct grazing, the endurance, and creep resistance corrective strategy of a hardened material. The adhesives for methods, or the sealing material for working joint of a building. An object of this invention is to provide the hardenebility constituent which can give the hardened material excellent in stability sealing material for multiple glass, the sealing material for speed signal generator construction

andurance, and croop resistance. Means for Solving the Problem By using on silicon a silicon containing functional group which has threa or more hydrolytic basas as

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wention persona may solve such a problem, It found out improving stability, endurance, and craep reactive silicon group of this polymer, as a result of inquiring wholeheartedly, in order that this

esistance, and this invention was completed.

That is, the 1st is related with stability, andurance, and crosp resistance corrective strategy of a control material using an organic polymer (by white has a selicion containing functional group which an construct a bridge by forming a silosane bond of this invention, and a hardenshifty constituent or to be a bridge by forming a silosane bond of this invention, and a hardenshifty constituent or the property of the propert

he 2nd is an organic polymer which has a silicon containing functional group which can construct a oridge by forming a siloxane bond of this invention, A silicon containing functional group which can

containing silicate (B).

resistance corrective strategy of a hardened material using on silicon a hardenability constituent containing an organic polymer (A1) which is a silicon containing functional group which has three or construct a bridge by forming a siloxane bond, It is related with stability, endurance, and creep more hydrolytic bases.

indurance, and creep resistance corrective strategy of a hardaned material given in the above using A main chain of an organic polymer (A1) which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment. It is related with stability,

it is related with stability, endurance, and creep resistance corrective atratagy of a hardened material given in said either using a hardenability constituent which contains silicate (B) further as a desirable a hardenability conactuent which is an acrylic eater aystem copolymer manufacturad by a living adical-polymerization mathod (meta).

ambodiment.

t is related with stability, endurance, and creep resistance corrective strategy of a hardened material given in said either using a hardenability constituent which contains carboxylic acid tin salt (C) further as a desirable embodiment.

it is related with stability, endurance, and creep resistance corrective strategy of a hardened material given in said either using a hardenability constituent which contains an organic tin catalyst (D) further as a desirable embodiment. 9014

The 3rd is an organic polymer which has a silicon containing functional group which can construct a functional group which can construct a bridge by forming a siloxane bond, and has it 1.7~5 pieces. andurance, and creep resistance corrective strategy of a hardened material using a hardenability bridge by forming a siloxane bond of this invention. This organic polymer is related with stability, constituent which is an organic polymer (A2) which averages par molacule a silicon containing

desirable embodiment. It is related with stability, endurance, and creep resistance corrective strategy A silicon containing functional group which can construct a bridge by forming a siloxane bond as a

of a hardened material given in the above using on silicon a hardenability constituent which is a silicon containing functional group which has three or more hydrolytic bases.

An organic polymer in which an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment introduced an unsaturation group into an end, and general formula (1): +-(SIR12+Xb0) =-SIR23-xx(1)

different. When the Tori ORGANO siloxy group shown by anyl group of the carbon numbers 6-20, an an alkyl group of the carbon numbers 1-20 from which R^1 in a formula and R^2 were the same as or aralkyl group of the carbon numbers 7–20, or ${
m (RY)}_3{
m SiO}-$ ia shown and ${
m R}^1$ or two or more ${
m R}^2$ exist, numbers 1-20 here, and three R' may be the same and may differ. X shows a hydroxyl group or a they may be the same and may diffar. R' is a hydrocarbon group of monovalence of the carbon

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may differ. m shows an integar of 0 to 19. however --- what satisfies a+sigma b>=1 -- carrying out -it is related with stability, endurance, and creep resistance corrective strategy of a hardened material given in said either using a hardenability constituent which is an organic polymer obtained by an hydrolytic basis, and when two or more X exists, they may be the same and may differ. As for a. 0, 1, 2, or 3b shows 0, 1, or 2, respectively. About b in m bases (SiR $_{2-b}^{\rm L}X_b^{\rm D}$), they may be the same and addition reaction with a hydrosilane compound expressed.

An organio polymer in which an organio polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment introduced an unsaturation group into an end, and general formula (2):

(X in a formula shows a hydroxyl group or a hydrolytic basis, and three X may be the same and) It hardened material given in said either using a hardenability constituent which is an organic polymer may differ. It is related with stability, endurance, and creep resistance corrective strategy of a obtained by an addition reaction with a hydrosilane compound expressed. The 4th is an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond of this invention, and this organic polymer is a general formula (3):

(R³ in a formula a divalant organic group of the carbon numbera 1-20 which contain one or more -O-R3-CH(CH3)-CH2-(SIR1 2-bX b0) _ -SIR2 3-3X 3 (3)

sorts chosen from a group which consists of hydrogan, oxygen, and nitrogen as a composition atom) constituent which is an organic polymer (A3) which has a structure part with which it is expressed. endurance, and creep resistance corrective stratcgy of a hardened material using a hardenability show and] R1, R2, X, a, b, and m — the above — it is the same — it is related with stability, 0020

An organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment is a general formula (4). : -0-R3-C(CH3) =CH3 (4)

An organic polymer which introduced an unsaturation group expressed with $(\mathbb{R}^3$ is the same as the H-(SIR1 2-b x bO) m-SIR2 3-a X a (1) above), and general formula (1):

It is related with stability, endurance, and craep resistance corrective strategy of a hardened material addition reaction with a hydrosllane compound expressed with (\mathbb{R}^1 in a formula, \mathbb{R}^2 , X, a, b, and m are given in the above using a hardenability constituent which is an organic polymer obtained by an

An organic polymer which has a alifcon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment is a general formula (5). the same as the above).

creep resistance corrective strategy of a hardened material given in said either using a hardenability (R³ in a formula and X are the same as the above.) — it is related with stability, endurance, and -0-R3-CH(CH2)-CH3-SIX3 (5)

An organic polymer which has a silicon containing functional group which can construct a bridge by constituent which is an organic polymer which has a structure part with which it is expressed.

forming a sioxane bond as a destrable embodiment, it is related with stability, enduranos, and creep resistance corrective strategy of a hardened material given in said either using for a principal chain skeleton a hardenability constituent which is an organic polymer which does not contain an amide segment (-NH-CO-) substantially.

A allicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment is a general formula (8). :

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formula, respectively.) — it is related with stability, endurance, and craep resistance corrective intratagy of a hardened material given in asid either using a hardenebility constituent which is a basis threa R4 is the organic groups of monovalence of the carbon numbers 2-20 independently among a

is related with stability, endurance, and creep resistance corrective strategy of a hardened material given in said either, wherein a silicon containing functional group which can construct a bridge by forming a siloxane bond uses a hardenability constituent which is a triethoxy silyl group as a desirable

construct a bridge by forming a siloxane bond is related with thin layer hardonability corrective strategy using on silicon an organic polymer (A1) which is a silicon containing functional group which as three or more hydrolytic bases, and a hardenability constituent containing an organic tin catalyst The 5th is an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond of this invention, A silicon containing functional group which can

An organic polymer (A) which has a silicon containing functional group which can construct a bridge

precision-mechanical-equipment assemblies, a sealing material for direct grazing, a sealing material for multiple glass, a sealing material for speed signal generator construction methods, or a sealing when the 6th forms a siloxane bond of this invention, And adhesives for interior panels containing silicate (B), Adheaives for face panels, adhesives for tiling, adhasives for stone tensions, ceiling finishing adhesives, it is related with floor finishing adhesives, adhesives for finishing of wall, adhesives for car panels, the electrical and electric equipment an electron and adhesives for material for working joint of a building.

sealing material for multiple glass, a sealing material for speed signal generator construction methods, The 7th is an organic polymer which has a silicon containing functional group which can construct a construct a bridge by forming a siloxane bond, . It is characterized by containing an organic polymer bridge by forming a siloxane bond of this invention, A silicon containing functional group which can stone tensions, Ceiling finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, silicon. Adhesives for interior panels, adhesives for face panels, adhesives for tiling, adhesives for idheaives for precision-mechanical-aquipment assemblies, a sealing matarial for direct grazing, a adhesives for car panels. It is related with the electrical and electric equipment, an alectron and (A1) which is a silicon containing functional group which has three or more hydrolytic bases on or a sealing material for working joint of a building.

nechanical-equipment assemblies, a sealing material for direct grazing, a sealing material for multiple polymerization method (meta) to the above by which it is obtainsticrized A describeriot. Additionables for interest penels, additive to fraction the above. Only the interest penels, additive for the special penels, additional collection fraining additional penels. The office of the above to the final collectives for the penels, and the final additional penels for our panels, A main chain of an organic polymer (A1) which has a silicon containing functional group which can glass, a sealing material for speed signal generator construction methods, or a sealing material for it is related with the electrical and electric equipment, an electron and adhosives for precisionconstruct a bridge by forming a siloxane bond as a desirable embodiment. Using a hardenability constituent which is an acrylic ester system copolymer manufactured by a living-radicalworking joint of a building. As a desirable embodiment, containing silicate (B) further to said either by which it is characterized A description, Adhesives for intarior panels, adhesives for face panels, adhesives for tiling, adhesivas for ealing material for multiple gleas, a sealing material for speed signal generator construction methods. stone tensions, Calling finishing adhesives, floor finishing adhesives, adhesivas for finishing of wall, adhasivos for car panels, it is ralatad with the electrical and electric equipment, an electron and adhesivos for pracision-machanical-equipment assemblias, a scaling material for direct grazing, a

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or a sealing material for working joint of a building

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characterized A description. Adhesives for interior panels, adhesivas for face panels, adhesives for tiling, adhesivas for stone tensions. Ceiling finishing adhesives, floor finishing adhasivas, adhesives for electron and achesives for precision-mechanical-equipment assemblies, a sealing material for direct grazing, a sealing material for multiple glass, a sealing material for speed signal generator construction As a desirable embodiment, containing carboxylic acid tin salt (0) further to said either by which it is finishing of wall, adhesives for oar panels, it is related with the electrical and electric equipment, an methods, or a sealing material for working joint of a building.

electron and adhesivus for precision-mechanical-equipment assemblies, a sealing material for direct grazing, a scaling material for multiple glass, a sealing material for speed signal generator construction tiling, adhesives for stone tensions, Ceiling finishing adhesives, floor finishing adhesives, adhesives for As a desirable embodiment, containing an organic tin catalyst (D) further to said either by which it is finishing of wall, adhesives for car panels, it is related with the electrical and electric equipment, an characterized A description, Adhosives for interior panels, adhesives for face panels, adhesives for methods, or a sealing material for working joint of a building.

related with the electrical and electric equipment, an electron and adheafues for presideour mechanical equipment, as easing material for freet grazing, a sealing material for multiple sizes a sealing material for multiple sizes, as sealing material for multiple sizes, as sealing material for multiple sizes, as sealing material for multiple sizes. The 8th is an organic polymar which has a silloon containing functional group which can construct a bridge by forming a siloxane bond of this invention. It is characterized by this organic polymer baing an organic polymer (42) which avarages per molecule a silicon containing functional group which can construct a bridga by forming a siloxane bond, and has it 1.7-5 piaces. Adhesives for interior panels. adhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for car panels, it is adhesives for face panels, adhasives for tiling, adhesives for stone tensions. Ceiling finishing [0032]

it is related with the electrical and elactric equipment, an electron and adhesives for precision— mechanical-equipment assemblies, a sealing material for direct grazing, a sealing material for multiple desirable embodiment. That it is a silicon containing functional group which has three or more bydedyclasses on silicon to the above by which it is characterized A deactioning, Adhesives for interior namely, advented, and ensure To from to panels, and ensure the title, adhesives for the tronstonato. Calling interior namels, adhesives for the tronstonato. Calling interior groups and provided and provided and adhesives, for or panels, intering adhesives, for our panels, A silicon containing functional group which can construct a bridge by forming a siloxane bond as a glass, a scaling material for speed signal generator construction methods, or a scaling material for working joint of a building.

An organic polymer in which an organic polymer which has a allicon containing functional group which can construct a bridge by formities a bichare board as a desirable embodiment introduced an unsaturation group into an ord and a general formals (1): working joint of a building. 0034

That it is an organic polymer obtained by an addition reaction with a hydrosilane compound expressed 2-bX bO) m-SIR2 3-aX a (1)

tiling, adhesives for stone tensions, Ceiling finishing adhesives, floor finishing adhesives, adhesives for grazing, a scaling material for multiple glass, a scaling material for speed signal generator construction electron and adhesives for precision-mechanical-equipment assemblies, a sealing material for direct finishing of wall, adhesives for car panels. It is related with the electrical and electric equipment, an characterized A description, Adhesives for interior panels, adhesives for face panels, adhesives for with (R¹ in a formula, R², X, a, b, and m are the same as the above) to said either by which it is methods, or a sealing material for working joint of a building

An organic polymer in which an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a destrable embodimant introduced an unsaturation group into an end and a general formula (2): nttp://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2F%2Fwww4.ipdl.i.. 2010/04/30

ascription, Adhesives for interior panels, adhesives for face panals, adhesives for tiling, adhesives for That it is an organic polymer obtained by an addition reaction with a hydroallane compound expressed dhesives for precision-mechanical-equipment assemblies, a sealing material for direct grazing, a sealing material for multiple glass, a sealing material for speed signal generator construction methods, tone tensions, Calling finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, idhesives for car panels. It is related with the electrical and electric equipment, an electron and vith (X in a formula is the sama as the above) to said either by which it is characterizad A or a sealing material for working joint of a building.

oridge by forming a siloxane bond of this invention, and this organic polymer is a general formula (3). The 9th is an organic polymer which has a silicon containing functional group which can construct a -O-R3-CH(CH3)-CH2-(SIR12-bXbO) m-SIR23-x (3)

machanical-cquipment assemblies, a sealing material for direct grazing, a sealing material for multiple glass, a sealing material for spead signal generator construction methods, or a sealing material for It is characterized by being an organic polymer (A3) which has a structure part expressed with (R1 adhesives, floor finishing adhesives, adhasives for finishing of wall, adhesives for car panels, it is n a formula, R², R³, X, a, b, and m are the same as the above). Adhesives for interior panels, adhesives for face panels, adhesives for tiling, adhesives for stone tensions, Ceiling finishing elated with the electrical and electric equipment, an electron and adheavas for precisionworking joint of a building.

An organie polymer which has a silloon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment is a general formula (4). :

O-R1-C(CH,) =CH, (4)

An organic polymer which introduced an unsaturation group expressed with (R¹ is the same as the

H-(SIR² 2-b X bO) m-SIR³ 3-3 X a (1) above), and general formula (1):

That it is an organic polymer obtained by an addition reaction with a hydrosilane compound expressed grazing, a sealing material for multiple glass, a sealing material for speed signal generator construction oharacterized A description, Adhesives for interior panels, adhesives for face panels, adhesives for tiling, adhesives for stone tensions. Celling finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, adheaves for oar panels, it is related with the electrical and electric equipment, an alectron and adheaves for precision-machanical-equipment assemblies, a sealing material for direct with (R² in a formula, R³, X, a, b, and m are the same as the above) to the above by which it is

An organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment is a general formula (5). nethods, or a sealing material for working joint of a building

-0-R1-CH(CH,)-CH,-SiX, (5)

related with the electrical and electric equipment, an electron and adhesives for precision-mechanical-equipment assemblies, a sealing material for direct grazing, a sealing material for multiple (Ye'l in a formula and X are the same as the above.)—a description to said either being an organic polymer which has a structure part with which it is expressed. Advanced A chieckee for interior panels, adheavies for thing, adheavies for the same is adheavies for the panels, adheavies for thing, adheavies for store transions. Geling finishing glass, a scaling material for speed signal generator construction methods, or a scaling material for adhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for car panels, it is working joint of a building.

An organic polymar which has a silicon containing functional group which can construct a bridge by forming a siloane bord as a describe embodiment. That it is an organic polymer which does not contain an emide segment (-HH-CO) substantially in a principal chair skeltors to said either by

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chesives for tiling, adhesives for atona tanaiona, Calling finishing adhaaivas, floor finishing adhesives adhasives for finishing of wall, adhosives for car panels. It is related with the electrical and electric material for direct grazing, a sealing material for multiple glass, a sealing material for speed signal equipment, an electron and adhesivas for precision-machanical-equipment assemblias, a aealing which it is characterized A description, Adhesives for interior panels, adhesives for face panels, generator construction methods, or a saaling material for working joint of a building.

A silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment is a general formula (6). : 0040

R4 in a formula is the same as the above.) --- a description to said either being a basis expressed, SI(OR*), (6)

sealing material for multiple glass, a scaling material for speed signal generator construction methods. adhesives for precision-mechanical-equipment assemblies, a sealing material for direct grazing, a Adhesives for interior panels, adhesives for face panels, adhesives for tiling, adhesives for stone adhesives for car panels, it is related with the electrical and electric equipment, an electron and tensions, Ceiling finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, or a scaling material for working joint of a building.

description, Adheaives for interior pasala, adheaives for face panels, adheaives for thing, adheaives for and the translation of the chain of the ch sealing material for multiple glass, a scaling material for speed signal generator construction methods. desirable embodiment. That it is a triethoxy silyl group to said aithar by which it is characterized A A allicon containing functional group which can construct a bridge by forming a alloxana bond as a adhesives for precision-mechanical-equipment assemblies, a sealing material for direct grazing, a or a sealing material for working joint of a building. The 10th is an organic polymer which has a silicon containing functional group which can construct a oridge by forming a siloxane bond of this invention, A silicon containing functional group which can

construct a bridge by forming a siloxene bond is related with an organic polymer (A1) which is a silicon constaining transitional growth which has three or more hydrolytic bases on silicon, and a hardenebility constituent containing silicate (B).

As a desirable embodiment, silicate is related with a hardenability constituent given in the above being a condensate of tetra alkoxysilane,

silicon containing functional group which has three or more hydrolytic bases on silicon, and a hardenability constituent containing carboxytic acid tin salt (C1) whose carbon of an alpha position of The 11th is an organic polymer which has a silicon containing functional group which can construct a construct a bridge by forming a siloxane bond, It is related with an organic polymer (A1) which is a bridge by forming a siloxane bond of this invantion, A allicon containing functional group which can a carboxyl group is the 4th class carbon. The 12th is an organic polymer which has a silicon containing functional group which can construct a construct a bridge by forming a siloxane bond is related with an organic polymer (A1) and carboxylic bridge by forming a siloxane bond of this invention, A silloon containing functional group which can ydrolytic bases on silloon, and a hardenability constituent containing an organic tin catalyst (D). acid tin salt (C) which are the silicon containing functional groups which have three or more

The 13th is an organic polymer which has a silicon containing functional group which can construct a bridge by forming a silocare bond of this invention. A silocan containing functional group which cen-neutrate taking by forming a slocare bond is rather of with an organic polymer (AI) which is a silocan containing functional group which has three or more hydrolytic bases on siloca, and a hardenshilly constituent containing a non-thin catalyset (E). nttp://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdLi.. 2010/04/30

The 14th is an organic polymer which has a silicon containing functional group which can construct a oridge by forming a siloxane bond of this invention, A silicon containing functional group which can

construct a bridge by forming a alloxane bond is related with an organic polymer (A1) which is a silicon containing functional group which has three or more hydrolytic bases on silicon, and a nardenability constituent containing a minute hollow body (F). he 15th is an organic polymer which has a silicon containing functional group which can construct a construct a bridge by forming a siloxane bond, it is a hardenability constituent containing an organic oridge by forming a siloxane bond of this invention, A silicon containing functional group which can

polymer (A1) which is a silicon containing functional group which has three or more hydrolytic bases on silicon, and is related with a hardenability constituent, wherein this organic polymer is 5 to 28 % of the weight in a total amount of a hardenability constituent.

An organic polymer in which an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment introduced an unsaturation group into an end, and general formula (2); 0049]

It is related with a hardenability constituent given in said either being an organic polymer obtained by an addition reaction with a hydrosilana compound expressed with (X in a formuls is the same as the

A allicon containing functional group which can construct a bridga by forming a siloxane bond as a

desirable embodiment is a general formula (6).: Si(OR*) 3 (6)

t is related with a hardenability constituent given in said either boing a basis expressed with (Rf in a ormula is the same as the above).

containing functional group which can construct a bridge by forming a siloxane bond of this invention, and can construct a bridge by forming a siloxane bond is a general formula (6). A silicon containing functional group which the 16th is an organic polymer which has a silicon

Si(0R⁴)₃ (6)

An organic polymer (A4) which has a basis expressed with (R4 in a formula is the same as the above), and general formula (7):

(Among a formula, $c R^5$ is the organic groups of monovalence of the carbon numbers 1-20 (OR⁶)_{3-c} (7)

independently, and 3-c R⁶, respectively) It is an organic group of monovalence of the carbon numbers 2-20 independently, and o shows 0, 1, or 2, respectively. It is related with a hardenability constituent in which storage stability containing an aminosilane coupling agent (G) which has a basis expressed

containing functional group which can construct a bridge by forming a siloxane bond of this invention, A silicon containing functional group which the 17th is an organic polymer which has a silicon has been improved.

An organic polymer (A4) which has a basis expressed with (R⁴ in a formula is the same as the above), and can construct a bridge by forming a siloxane bond is a general formula (6). - SKOR⁴)₃ (6)

SiR7,(OCH3), (OR8) 3-d-10 (8) and general formula (8):

Among a formula, d R7 is the organio groups of monovalence of the carbon numbers 1-20

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constituent in which a cure rate recuperating oneself baforahand in this hardenability constituent has aminosilane coupling agent (H) which has a basis expressed, and is related with a hardenability

containing functional group which can construct a bridge by forming a siloxane bond of this invention, A silioon containing functional group which the 18th is an organic polymer which has a silioon and can construct a bridge by forming a siloxane bond is a general formula (6). : been improved.

It is related with an organic polymer (A4) which has a basis expressed with (R4 in a formula is the same as the above), and a hardenability constituent containing epoxy resin (I). A silicon containing functional group which the 19th is a polyoxyalkylene series polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond of this invention, and can construct a bridge by forming a siloxane bond is a general formula (6).

A polyoxyalkylene series polymer (A5) which has a basis expressed with (R4 in a formula is the same

as the above), And it is ralated with a hardenability constituent containing an acrylic ester system which has a silicon centaining functional group which can construct a bridge by forming a alloxana copolymar (A6) which has a silicon containing functional group which can construct a bridge by A silicon containing functional group which the 20th is a saturated hydrocarbon system polymer forming a siloxane bond (meta).

bond of this invention, and can construct a bridge by forming a siloxane bond is a general formula (6). - Si(OR*), (6)

It is related with a hardenability constituent containing a saturated hydrocarbon system polymer (A7) which has a basis expressed with (Rt in a formula is the same as the above).

The 21st is an acrylic ester system copolymer which has a silicon containing functional group which can construct a bridge by forming a siloxane band of this invention (meta). A silicon containing functional group which can construct a bridge by forming a siloxane band is general formula (6)-Si

it is related with a hardenability constituent containing an acrylic eater system copolymer (A8) which has a basis expreased with (R4 in a formula is the same as the above) (mata-). (OR*), (6).

An organic polymer in which an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment introduced unsaturation group into an end, and general formula (9):

H-SKOR*), (9)

It is related with a hardenability constituent given in said cither being an organic polymer obtained by an addition reaction with a hydrosilane compound expressed with (being the same as R* above in a formula).

forming a siloxane bond as a desirable embodiment. It is related with a hardenability constituent given An organic polymer which has a silicon containing functional group which can construct a bridge by in said either being an organic polymer which does not contain an amide segment (-NH-CO-)

A silicon containing functional group which can construct a bridge by forming a siloxane bond as a describle embodiment is related with a hardenability constituent given in said either being a triethoxy substantially in a principal chain skeleton.

silyt group.

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4 cilloon containing functional group which the 22nd ia an organic polymer which has a silloon containing functional group which can construct a bridge by forming a siloxana bond of this irvention.

ontaining functional group which can construct a bridge by forming a siloxana bond of this and can construct a bridge by forming a siloxana bond is a general formula (6): SIG(PR), (8)

General formula (10) carrying out the estor exchange reaction of the compound (J) which has at least one methoxy group which can carry out an ester axchange reaction to an organic polymer (A4) which

has a basis expressed with (R 4 in a formula is the same as the above) : $- S(OCH_3)_{\phi}OR^4\rangle_{3,\phi}$ (10)

imming a formula, $3+R^4$ is the organic groups of monovalence of the carbon numbers 2-20 mindependently, respectively, and 7×10^{-2} or 1×10^{-2} or

Hereafter, this invention is explained in detail.

(10062)

The state of the state

chain skeletons. Specifically A polyoxycthylene, polyoxypropylena, polyoxy butylene, Polyoxy tetramethylen, a Specifically A polyoxycthylene,

disclarify A relacionshipm, polycomorphism, polycom surplining. Polycom such as a polycomes auchin as a polycome such as a polycome of polycome of polycome of polycomes of

representation of addition of an additive additional control and addition of a publishment of a publishment of polymeration or epidlem-reminuations and A. A how account of season between any additional and a publishment of publi

Saturated hydrocarbon system polymers, such as polyirebutylene, hydrogenation polyisoprene, and Saturated hydrocarbon system polymers, such as polyirebutylene, hydrogenation polybriodyne, and service (meta) hydrogenation polybridadium, and a polytyosylelydene parties polymer and an orotific respect (meta) hydrogenation polybridadium, and service (meta).

Victorianton polypradente, and a polycytaleyten enters polymer and an extynutation tuned system copolymer lave a comparatively fore glass transition temperature, and their hardened material oblating is preferred especially from excelling in cold resistance. In a principal chain scheduton of the abover-mentioned organic polymer (A), other ingredients, such as a unusumente bord ingredient, may be included in the range which does not epoil an effect of this investion greats.

(1008) It is not limited especially as the above-mentioned urcthanc bond ingradient, but For example, bolione (baylens) discoyanate, Aromatic system polyisocyanates, such as diphenylmethana ttp://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?stw_u=http%3A%2F%2Fwww4.ipdli... 2010/04/30

JP,2006-316287,A [DETAILED DESCRIPTION]

discoyante and vylylens discoyanteri, isophorone discoyante, What is obtained from a readition of polyleosparate compounds, such as alightetic series system polyierosymetes, such as hexamethylore dispoyantes, and polyol which has various kinds of above mentioned principal chain skeletons can If there are many amide segments (AH-OD generated as principal enhalosidents based on said unutatane book, viscority of an organic polymer will become high and surver as a bad constituent of workships, Therefore, as translatify of an amide segment coupled in a principal chain skeleton of workships, Therefore, as translatify of an amide segment coupled in a principal chain skeleton of workships, The are preferred that it is a principal chain skeleton of a 20 feets of surveying that more preferred that it is not seed for the weight, it is more preferred that as anoido segment is not included substantially.

or less > of the Notific and it is most pretored use an amone sequence in the uncourse suscentives; (10068)
A reactive allocor group contained in an organic podymer which has a reactive allocor group is a basis which not overture a feeting by forming a allocated by the creation which has a hydroxy for one which has a hydroxy for one or a hydroxy be also compined which has a signor after, and is accolarated by a slightly constituted.

catalyst. As a reactive silicon group, it is a general formula (11): - (SiR $^1_{2-b}X_bO)$ m-SiR $^3_{3-a}X_a$ (11)

an abel group of the cachen number 1–20 from which $\beta^{\prime\prime}$ is formal and $\beta^{\prime\prime}$ were the same as or different three the Trick ORGANO Sizago are group shown by and group of the carbon numbers $\theta^{\prime\prime}$ 20, an analog group of the carbon numbers $\theta^{\prime\prime}$ 20, and the same and the carbon numbers $\theta^{\prime\prime}$ 20 or (15) 360° is shown and $\beta^{\prime\prime}$ or frow on more $K^{\prime\prime}$ early when the value of the carbon numbers 1–20 here, and then $\delta^{\prime\prime}$ 10 is a hydrocarbon group of numovalence of the suffer interpretable between the tree $\delta^{\prime\prime}$ 10 is the same and may differ. A shown is photosyl group or a hydrochylic basis, and when two or more X axids, they may be the same and may differ A as for a_{i} , a_{i} , a_{i} , a_{i}), they may be the same and may differ A as for a_{i} , $a_{$

It is not be finished but which is nonecasty of these a conventionally builty belowed introducible basis especially as a place and the part of built introducible basis specially be the Specialisty, a hydrogen action, a holden stem, an allowing group, an exploring group, an exploring group, an exploring group, an exploring group, an entire group, and an entire group, and an entire group, and an entire group, and an entire group, and an entire group, an entire group, and an entire group and an entire group, and an entire group and an entire group, and an

a basis expressed is raised.

(10/70)

(Fortigon and a professyl group can be combined with one allicon stom in the 1–3 ranges, and 4 (veriginals) has 1–5 preferred ranges. When a Howboytbe basis and a hydroxy group plu together in (Everiginals) has 1 reserve, eilcon group, plut froy may be the same and may differ.

In particular, it is a general formula (12) :

007

- SiR² 3-a X a (12)

(R² and X are the same as the above among a formula.) Since a reactive silicon group expressed with integer of 1–3 is easy to receive, a's is preferred. [0172]

As an example of Pl. in the absorverantioned general install (1) and (1), and Pl. For example, such great and from the organization and proper and any former and any entry former and any former and former

Liuuza. Aa more concrete illustration of s reactive sillicon group, a trimethoxysily group, a triebtoxy silly group, and a group, a direttoxymethyl silyl group, a diethoxymethylsilyl group, and a http://www4.jpdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.jpdl.i. 2010/04/30

especially in this invention, an organic polymer which has the silicon containing functional group (that is, the number of arbxm of a general formuls (11) is three or more) which three or more hydrolytic bases combined on silicon in an organic polymer of the (A) ingredient can be used as an ingredient

shown as compared with a case of reactive silicon group containing organic polymer which has two or Good stability is shown and remarkable creep resistance and an endurance improvement effect are silicon, and constructed the bridge by a silanol condensation reaction of that reactive silicon group. A hardened material which three or more hydrolytic bases had combined this (A1) ingredient on ess hydrolytic bases. (At) As for the number of arbom of a general formula (11) of an ingredient, it is more preferred that it is 3-5, and especially 3 is preferred. Also in it, since [that its improvement offoot of the stability of a alkoxyl group of the carbon numbers 1-20 is preferred, its thing of the carbon numbers 1-10 is more nardenability constituent of this invention, endurance, and creep resistance is especially large and] the Tori slkoxy silyl groups has the good availability of a raw material, it is preferred. Thing of an

trimethoxysib/ group and a triethoxy silv/ group ere the most preferred. Hardenability may become lete when a carbon number is lerger than 20. preferred, and its thing of the cerbon numbers 1-4 is still more preferred here. Specifically, a

constituent becomes low, it is known that the endurance of a hardened material obtained will fall to Benerally, if weight % of reactive silicon group containing organic polymer in a hardenability

PM. However, if an ingredient (A1) of this invention is used as reactive silicon group containing organic containing organic polymer in a hardenability constituent. Therefore, five to 28% of the weight, when it s 15 to 24 % of the weight especially preferably, since a rate of an ingredient (A1) in a herdenability constituent is compatible in low cost and high endurance, it is more preferably preferred [rate] ten polymer, high endurance is maintainable even if it makes low weight % of reactive silicon group

to 26% of the weight.

Especially in this invention, an organic polymer which has the Tori alkoxy sily! groups of the oarbon numbers 2-20 can be used as a (A4) ingredient in an organic polymer of an ingredient (A1). Namely,

general formula (6): - SI(OR*) 3 (6)

(three R4 is the organic groups of monovalence of the carbon numbars 2-20 independently emong a formula, respectively.) -- an organic polymer which has a basis axpressed can be used as a (A4) It is known that methanol generated in connection with a hydrolysis reaction of a methoxy silyl group number of an alkoxy group which combines the (A4) ingredient with a silicon atom is 2 to 20, toxio has peculiar toxicity of causing an obstacle of an optic nerve. On the other hand, since a carbon nigh methanol is not contained in alcohol generated in connection with a hydrolysis reaction of s esctive silicon group, but serves as a constituent with high safety at it.

generated by hydrolysis has the highest safety, it is the most preferred [as for a carbon number of ,A4) It is preferred that it is especially 2-4, and when it is 2, it serves as ethanol, and since alcohol Specifically, a triethoxy silyl group is the most preferred. When a carbon number is larger than 20, while the hardenability of a hardenability constituent may become late, en anesthetic action end R⁴ of a general formula (6) of an ingredient, it is more preferred that it is 2-10, and / slcohol].

stimulation of alcohol to generate may be large.

Especially in this invention, a principal chein skeleton oan use as a (AS) ingredient what is polyoxyalkylene in an organic polymer of the (A4) ingredient. Namely, general formula (6) :

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IP,2006-316287,A [DETAILED DESCRIPTION]

A polyoxyelkylene scries polymer which has a basia exprassad with (R⁴ in a formula is the same as the above) csn be used as a (A5) ingredient.

effective network chain density of an organic polymer (A) ingredient contained in a hardened material 1.1-5 reactive ellicon groups of an organic polymer (A) exist preferably. If that averege per molecule and at least one piece exists 1, and more preferably. If the number of reactive silicon groups become insufficient and will become difficult to reveal a good rubber clasticity action. A reactive silicon group may exist in an end of an organic polymer (A) chain, and may exist in an inside. Since formed eventually will increase if a reactive silicon group exists in an end of a chain, a rubber-like hardened meterial in which a low elastic modulus is shown becomes is easy to be obtained by high contained in one molecule of organic polymers (A) will be less than one piece, hardenability will intensity and high elongation.

Especially in this invention, an organic polymer the number of reactive silicon groups per molecule averages, and 1.7-5 pieces exist in an organic polymer of the (A) ingredient can be used as an ingredient (A2).

reaction of thet reactive silloon group, Good stability is shown, tha number of reactive silloon groups A hardened material which the numbar of reactive silicon groups per molecule averaged this (A2) ingredient for it, and 1.7-5 pieces existed, and constructed the bridge by a silenol condensation

that they are 2-4 pieces, and it is preferred that they are especially 2.3-3 pieces. When there are few A2) As for the number of reactive silicon groups per molecule of an ingredient, it is more preferred

per molecule averagea, and remerkable oreep resistance and an endurance improvement effect are shown as compared with a case of less than 1.7 organic polymers.

constituent of this invention, endurance, and creep resistance may not be enough, and when larger 1.7 reactive silicon groups per molecule, an improvement effect of the stability of a hardenability than five pieces, clongation of a hardened material obtained may become small.

Especially at this invention, it is a general formula in an organic polymer of the (A) ingredient (3). -0-R3-CH(GH3)-CH2-(SIR1 2-bX bO) m-SIR2 3-1 X (3)

sorts chosen from a group which consists of hydrogen, oxygen, snd nitrogen as a composition atom) [show and] R1, R2, X, a, b, and m -- the above -- it is the seme -- an organic polymor which has a (R3 in a formule a divalent organic group of the carbon numbers 1-20 which contain one or more

A herdened meterial which this (A3) ingredient has a structura pert expressed with a general formula (3), and constructed the bridge by a silanol condensation reaction of that reactive silicon group

structure pert with which it is expressed can be used as a (A3) ingredient.

shows good stability, and shows remarkable creep resistance and an endurance improvement effect ss compared with a case of an organic polymer which has terminal structures other than a general As for s carbon number of R³ of a general formula (3), it is more preferred from s point of availability that it is 1–10, and it is preferred that it is especially 1–4. Specifically, \mathbb{R}^2 has the most preferred methylcne group.

(A3) An ingredient is a general formula (5).:

-0-R3-CH(CH3)-CH2-SIX3 (5)

nardenability constituent of this invention, endurance, end creep resistance is especially large end] (R³ in a formula and X are the same as the above.) — when it is an organic polymer which has a structure part with which it is expressed, since [that an improvement offect of the stability of a

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he availability of a raw material is good, it is desirable.

(A) What is necessary is just to parform introduction of a reactive silloon group of an ingredient by a publicly known method. That is, the following methods are mentioned, for example,

insituration group content organicity polymer is obtained by copolymerization with an unsaturation group content epoxy compound. Subsequently, hydrosilane which has a reactive silleon group is made rectivity to an organic polymer which has functional groups, such as a hydroxyl group, in a molecule to this functional group react, and obtain an organic polymer containing an unsaturation group. Or an b) Make an organic compound which has an active group and an unsaturation group which show to act on an acquired resultant, and it hydrosilylates.

(*e.) Make a compound which has a sulfinydryl group and a reactive silicon group react to an organic polymer containing an unsaturation group produced by making it be the same as that of the (b)

(#e) Make a compound which has a functional group and a reactive alloon group which thow researchivy to an organic polymer which has functional groups, such as a hydroxyl group, an epoxy group, and an isocypantic group, in a malecula to this functional group resect.

Since a high inversion rate is obtained in comparatively short reaction time, a method of making a

ydroxyl group react to an and a method of (b) or among (**)s in the abova method is preferred. An polymer obtained by a method and an organic polymer obtained by a method of (**) have the strong becoming a good hardenability constituent of workability by hypoviscosity rather than an organic compound which has a polymer, an isocyanste group, and a reactive silicon group which have a organic polymer which has the reactive silicon group obtained by a method of (b), (**) Since bad smell based on an mercaptosilane, especially its method of (b) is preferred.

b) As an example of a hydrosilane compound used in a method. For example, trichlorosilane, methyldi chlorosilicane, dimethylchlorosilicane, Halogenation Silang like phenyl dichlorosilane; Trimethoxysilane, friethoxysilane, methyldiethoxysilane, methyl dimethoxysilane, The alkoxysilane like phenyl

Jimethoxysilane; Methyldi acetoxysilane. The acyloxy silanes like a phenyldiacetoxysilane; although halogenation Silang and alkoxysilans are preferred, espacially alkoxysilans has the quiet hydrobysis nature of a hardenability constituent obtained, and it is the most preferred to a handling and cone he KETOKISHI mate silancs like bis(dimethyl KETOKISHI mate)methylsilanc and bis(cyclohexyl (ETOKISHI mate)methylsilane are raised, it is not limited to these. Especially among these,

in the above-mentioned hydrosilans compound, it is a general formula (2). :

Since a hydrosilane compound expressed with (X in a formula is the same as the above) has an H-SiX, (2)

especially large improvement effect of the stability of a hardenability constituent which consists of an rialkoxysilane, such as trimethoxysilane, triethoxysilane, and a triisopropoxy silane, is more proferred. organic polymer obtained by an addition reaction of this hydrosilane compound, endurance, and creep resistance, it is preferred. In a hydrosilane compound expressed with a general formula (2),

disproportionation progresses] dimethoxysilane — a dangerous compound arises in inside. From a riskoxysilane in which carbon numbers, such as trimethoxysilane, have an alkoxy group (methoxy group) of 1 also in said trialkoxysilane is like [when disproportionation may advance quickly and riewpoint of safety on handling to a general formula (9):

is preferred to use trialkoxysilans which has an alkoxy group whose carbon number exprassed with

 \mathbb{R}^4 in a formula is tha same as the above) is two or more. A viawpoint of availability, safety \underline{L} on

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JP,2006-316287,A [DETAILED DESCRIPTION]

handling], stability [of a hardenability constituent obtained], endurance, and creep resistance ** to biethoxysilane is the most praferred.

example, etc. are mentioned, it is not limited in particular. As an example of a compound of having triethoxysilane, gamma-mercapto propylmethyl diethoxysilane, etc. are raised, it is not limited to radical addition reaction under a radical initiator and/or radical source-of-release existence, for compound which has a suifhydryl group and a reactive silicon group as a synthetic method by a **) Although a method of introducing into an unsaturation binding site of an organic polymer a propyltrimethoxysilane, gamma-mercaptpropylmethyl dimethoxysilane, gamma-mercaptopropyl said sulfhydryl group and a reactive silicon group. For example, although gamma-mercapto

(**) Although a method etc. which are shown in JP,H3-47825,A are mentioned, for example as a

method of making a compound which has a polymer, an isocyanate group, and a reactive silicon group particular. As an example of a compound of having said isocyanate group and a reactive silicon group. For example, although gamma-isocyanate propylitrinethoxysilane, gamma-isocyanate propylmethyl dimethoxysilane, gamma-isocyanatepropyl triethoxysilane, gamma-isocyanate propylmethyl which have a hydroxyl group reacting to an end among synthetic methods, it is not limited in

As mentioned above, as for a silane compound which three hydrolytic bases have combined with one which especially carbon numbers, such as trimethoxysilane, have an alkoxy group (methoxy group) of silicon atoms, such as trimathoxysilane, disproportionation may advance, As for trialkoxysilane in diethoxysilane, etc. are raised, it is not limited to these.

I, disproportionation may advance quickly. If disproportionation progresses, a remarkable dangerous neither gamma-mercapto propyltrimethoxysilane nor gamma-isocyanate propyltrimethoxysilane. For trimethoxysilyl group, as a silicon content group, it is preferred to use a synthetic method of (**) or compound [like] which is directhoxysilane will arise. However, such disproportionation advances in this reason, when using the Tori alkoxy silyl groups which has methoxy groups, such as a

As how to obtain an organic polymer which has the ailfoon content group combined with a methoxy group, it is one method of the above-mentioned (**), (**), and (**), and a reactive silicon group is a

general formula (6): :

- Si(OR*) 3 (6)

A compound (J) which has at least one methoxy group which can carry out an ester exchange reaction after obtaining an organic polymar (getting it blocked the above-mentioned (A4) ingredient) which has a basis expressed with $(\mathbb{R}^d$ in a formula is the same as the above). It is a general formula by carrying out an aster exchange reaction under existence of a transesterification catalyst or nonexistence (10): :

- Si(OCH₃) (OR⁴) 3-f (10)

independently, respectively, and f shows 1, 2, or 3.) — a method of manufacturing an organic polymer which has a basis expressed can be mentioned. An organio polymer which has a basis expressed with a general formula (10) shows fast curability rather than an organio polymer which has a basis (among a formula, 3-f \mathbb{R}^4 is the organic groups of monovalence of the carbon numbers $2 ext{-}20$

(**), by carrying out an ester exchange reaction to the aforementioned (J) ingredient. A method of In said manufacturing method, after introducing a reactive silicon group especially by a method of

expressed with a general formula (6).

dengerous compound like directboxy-silane by disproportionation arriang in the middle of mandiscture. Here are free hed arrells, and mis nice it becames a good instructionability constituent of workshifty by hypoxisosopy rather than an organic polymer objained by a matter of (k+k), it is more desirable than hypoxisosopy rather than an organic polymer objained by a matter of (k+k), it is more desirable than manufacturing an organic polymer which has a basis expressed with a general formula (10), Without a an organic polymer obtained by a method of (***). 2010/04/30 http://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdli...

As a compound (J) which has at least one above-mentioned methoxy group which can carry out an ester exchange reaction, there is no limitation in particular and various kinds of compounds can be

nethoxy groups on the same silicon atom as a compound which has the silicon atom combined with especially a compound that has a silicon atom united with 2-4 methoxy groups on the same silicon 4 compound etc. which have the silicon atom combined with mathyl ester of various kinds of acid, ngredient here can be mentioned. Since a compound which has the silicon atom united with 2-4 said at least one methoxy group has a quick ester exchange reaction speed, it is preferred. Since such as methanol, oarboxylic soid, and sulfonic soid, and at least one methoxy group as a (J) atom and an amino group has a quick ester exchange reaction speed, it is preferred.

propyltrimethoxysilane, N-phenyl-zamma-aminopropyl trimethoxysilane, and N-benzyl-gamma-aminopropyl trimethoxysilane, can be mentioned. A denatured derivative and a condensation reaction When it illustrates concretely, gamma-aminopropyl trimethoxysilane, gamma-aminopropyl methyl dimethoxysilane, gamma-(2-aminoethyl) aminopropyl trimethoxysilane, gamma-(2-aminoethyl) aminopropyl methyl dimethoxysilane, Amino group content Silang, such as gamma-ureido

Since an ester exchange resotion advances also under existence of a transesterification catalyst and comparatively low temperature conditions 60 ** or less, aforementioned amino group content Silang

thing of the above-mentioned silane compound can also use the above-mentioned silane compound

as a (J) ingredient.

exchange reaction in 0.1-10 copies to 100 copies of reactive silicon group containing organic polymer of the (A4) ingredient. It is preferred to use it in 1-5 copies especially. The above-mentioned (J) As for the (J) ingredient used for this invention, it is preferred to use and carry out an ester ngredient may be used only by one kind, and may carry out two or more kind mixing use.

50,000 in polystyrene conversion in GPC. When there is a tendency whose number average molecular weight is inconvenient in respect of the extension characteristic of a hardened material et less than pranching, and the number average molecular weight is 1,000-30,000 more preferably 500 to about 500 and 50000 is exceeded, since it becomes hyperviscosity, there is an inconvenient tendency in An organic polymer (A) which has a reactive silicon group may have straight chain shape or

A reactive silicon group may be in an end or an inside of an organic polymar chain, and may be in both. Since effectiva natwork chain density of an organic polymar component contained in a reapact of worksbility.

molecular terminal, it is desirable from points, like a rubber-like hardenad material of high elongation hardened material formed eventually increases especially when a reactive silicon group is in a becomes is easy to be obtained with high intensity. 0110

Said polyoxyalkylene series polymer is a general formula intrinsically (13).:

Formula 1]

-R°-0-

(among a formula, R⁹ is a divalent organic group and is the straight chain shape or the branching alkylene group of the carbon numbars 1-14.) — it being a polymar which has a repeating unit shown. and, \mathbb{R}^9 in a general formula (13) has the carbon numbers 1–14, and also preferred straight chain shape or branched state alkylene group of 2–4. As the example of the repeating unit shown by a general formula (13), http://www4.ipdlinpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdli... 2010/04/30

JP.2006-316287,A [DETAILED DESCRIPTION]

Formula 2

-CH2CHO-CH2CH0---CH2O- --CH2CH2O---

-CH,CH,CH,CH20--CH2-CO ** is mentioned. The principal chain skeleton of a polyoxyalkylene series polymer may consist of one kind of repeating unit, and may consist of two or more kinds of repeating units. When used especially for sealent etc., it is desirable from that what comprises the polymer which uses a propylene oxide polymer as the main ingredients is amorphous, or the point which is hypoviscosity comparatively.

tem, a U.S. Pat. No. 3278458 item, A U.S. Pat. No. 3278459 item, a U.S. Pat. No. 3427256 item, a U.S. As a synthetic mathod of a polyoxyalkylene series polymer. For example, the polymerizing method by shown in a U.S. Pat. No. 3427335 item etc., ************* such as the polymerizing method using a complex catalyst like a complex produced by making an organoaluminium compound and porphyrin which are shown in JP 61-215623.A react, JP 46-27250,B, JP 59-15336,B, a U.S. Pat. No. 3278457 Pat. No. 3427334 item. The polymerizing method by a composite metal cyanide complex catalyst polymerizing method using a catalyst which consists of a phosphazene compound illustrated by an alkali catalyst like KOH, the polymarizing method by a transition metal compound-porphyrin ostalyst which consists of a polyphosphazene salt illustrated by JP.H10-273512.A, and the

JP,45-36319,B, 46-12154, JP,50-156599,A, 54-6096, 55-13767, 55-13468, What is proposed by each gazette, such as 57-164123, JP,3-2450,B, U.S. Pat. No. 3632557, U.S. Pat. No. 4345053, U.S. Pat. No. 4366307, and U.S. Pat. No. 4960844, JP,61-197631,A, 61-215622, 61-215623. Although 6,000 or more number average molecular weights and Mv/Mn witch are proposed by each grazetta of 61-218822. 19-pt3-7827A, 418-41826X, and ID-HE-2710TA can illustrate a polycystleyna series polymer with narrow molecular weight distribution in the 1.6 or less amount of Polymer Division, it is not A manufacturing method of a polyoxyalkylene series polymer which has a reactive silicon group,

JP.H11-060722.A. are not limited in particular.

A polyoxyalkylene series polymer which has the above-mentioned reactive silicon group may be used alone, and may be used together two or more sorts.

imited to in particular these.

carbon-carbon unsaturated bonds other than an aromatic ring, and a polymer which makes the Said saturated hydrocarbon system polymer is a polymer which does not contain substantially

propylene, 1-butene, and isobutylene, is polymerized as a main monomer, and] (2) After making diene functional group into an end, and tend to control a molecular weight and can increase the number of isobutylene system polymer and a hydrogenation polybutadiene system polymer tend to introduce a series, such as butadiene and isoprene, homopolymerize or carrying out copolymerization of the end functional groups, thay are preferred, and a composite ease to especially their isobutylene above-mentioned olefinic compound, can obtain by a method of hydrogenating, but. Since an skeleton, (1). [whether an olefinic compound of the carbon numbers 1-6, such as cthylene, system polymer is prafarred.

hat whose principal chain skeleton is a saturated hydrocarbon system polymer has the feature

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which is excellent in heat resistance, weatherability, andurance, and humidity interception nature.

All the monomeric units may be formed from an isobucytane unit, and an isobucytone wasten polymer, All the monomeric units may be formed from a single that the second is a requesting that which criginates in isobucytane from a field of rubbur property 500 of the waight or more is perferred, what criginates an isobucytane from a field of rubbur property 500 of the waight or more in perferred, what criginates 500 of the weight or more is more preferred, and essentially a thing contained 50 to 595, of the waight is preferred. For a synthetic method of a saturated hydrocarbon system polymer, although various polymerization methods are reported conventionally, esposity living polymerization what is alload of recent years many is developed. an institute polymerization (U.M.—P. Remedy et al.) which was found out by formerly and others in the case of a saturated hydrocarbon system polymer, especially an

isobutykne system polymer J. Polymer Sci. and Polymer Chem. Ed. 1997. By using 15 volumes and 2943 passes, meunfracturing exally is possible, about 500 to 100,000 molecular weight can be polymerized in 1.5 or less molecular veight distribution, and it is forown that verifous functional groups an be irroduced into a molecular veight distribution, and it is forown that verifous functional groups and be irroduced into a molecular verifinal.

mentioned. These may be used independently, and even if it carries out copolymerization of the

As a process of a suturated proteocerbon systems opporter without as renotive silent proup. For properties, p.4-69809. IJ 1797–1080281. U. R.6-254149. A through it writes in each beservition of prope-229940, P.4. P-197000. P. bestruit Gazerte No. 2539448, Patentt Gazerte No. 2539488, and UP.7-8739824. It is not finited to in particular types.

[0123] It is a general formula in a saturated hydrocarbon systam polymer which has the above-mentioned

reactive silicon group (6). : -- Si(OR⁴) ₃ (6)

Espocially (M.) a saturated hydrocarbon system polymer that has a basis conversed with CP in a politic in the same are the dayor of more to use of as an ingredient. This (M.) ingredient has the feature which is excellent in hear resistance based on a standarded hydrocarbon system polymer, which is excellent in hear resistance based on a standarded hydrocarbon system polymer. which is excellent in the configuration of the standard of the property and the one has generation of medium is occuratelying a hydrolysis readon of a reside allow proup and is a

polymer whose stability of a hardoned material, endurance, and oreop resistance are still batter. 10[104] A sattasted hydrocarbon system polymer which has the above-mentioned reactive sileon group may

be used alone, and may be used togsthint two or more sorta. [0128] to this invention, a chain can use what is an acrylic estar (meta) system copolymer as an Especially in this invention, a chain can use what is an acrylic estar (meta) system copolymer as an

ingradient (A6) in an organic polymer of the (A) ingredient.
[0158]
Expecting as an earylic ester (metal) gestom monomer which constitutes a main chain of the
expecting as an earylic ester (metal) gestom monomer which constitutes a main chain of the
expecting constitution of the consti

to used If it Burstens, sories and invitat, methyl advise in limided but versus forther burstens in the set of the set of

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incrementioned (metal) enrylic exter system copolymer; copolymerization of the following virty system moreover is illustrated, styrum: virthalane, alber-matriy system moreover it is transfer and the sub-properties of the system or some and the system or some and the system or some and the system or system or some and the system system context virty incomers, and is system or some and why system context virty formore. The system moreover, and a system or some and a system or some a system or system or system or system or system or system or system and system or system or system or system and system or system or system or system and system or system

preferred other monomers, copolymerization, and also that may earry out block copolymerization and ester monomer (meta) more preferably, is an acrylic polymar which consists of acrylic aster monomer monomers in that case. Acrylic acid (meta) expresses acrylic acid and/, or methacrylic acid with the preferably especially, and is a polymer which consists of butyl acrylates still more preferably. A point that physical properties, such as hypoviscosity of a compound, a low modulus of a handaned matchal, acrylate is excellent in oil resistance. However, since it follows on increasing a ratio of butyl acrylate and the good oil resistance is spoiled, as for the ratio, for a use of which oil resistance is required, it although limitation is not carried out, a copolymer of ethyl acrylata / butyl acrylate / acrylic acid 2are required is still more preferred. It can also transpose a part of ethyl acrylate to butyl acrylate in order to improve the low-temperature characteristic etc., without spoiling oil resistance, it is also preferred to use acylic soid 2-mothoxy ethyl, acylic soid 2-choxyethyl, etc. by which oxygen was introduced into an alkyl group of a side chain. However, since it is in a tendency for heat resistance resistance is required, it is praferred [the ratio] to make it to 40% or less, it is possible to obtain a to be inferior by introduction of an alkoxy group which has an ether bond in a side chain, when heat preferred, It is an acrylic polymer which consists of acrylic ester monomer and a methacrylic-acid-acrylata on the other hand in a use as which oil resistance, such as an automotive application, etc. order to raise that low-temperature characteristic, since it tends to be a little inferior to the lowtemperature characteristic (cold resistance), although a polymer mainly concerned with this ethyl is preferred to carry out to 40% or less, and also it is more preferred to make it to 30% or less. In colymer which changed the ratio and was suitable in consideration of physical properties neaded, butyl acrylate system monomer is still more preferred. A copolymer mainly concerned with ethyl such as oil resistance, heat resistance, and the low-temperatura characteristic, according to a various application or the purpose demanded. For example, as an example which is excellent in properties balance, such as oil resistance, heat resistance, the low-temperature characteristic, methoxy ethyl (it is 40-50/20-30/30-20 at a weight ratio) is mentioned. In this invention, it is these desirable monomers are contained not less than 40% by a weight ratio in these desirable monomer from physical properties etc. and (meta) an acrylic acid series monomer of output is plurality, they are not cared about. Especially, a polymer which consists of a styrene system above-mentioned expressive form. which it is not immore about with a measure in such as possible to an operated by the control of an article for the such as a synthetic method of an anopie case system concluder. (Ms.) between it has been operated to an anopie case are system concluded the size as not commonated, a personal, etc. as a softwardstate institute or such as value of miscellar weight commonated, a personal, etc. as a softwardstate institute or such as value of miscelar weight controlled to a value of miscelar weight controlled to a value of the controlled to a value of miscelar weight controlled to a value of the controlled to the controlled to

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JP,2006-316287,A [DETAILED DESCRIPTION]

sbove-mentioned "living-radical-polymerization method" has halogen comparatively edvantageous to halide compound An initistor, An "atom-transfer-radical-polymerization method" which polymerizes an scrylic estar (meta) system monomer by making a transition metal complex into e catalyst, As a volumes, 5614 pages, etc. will be mentioned as this atom-transfer-radical-polymerization method in nanufacturing method of an acrylic ester system copolymer which in addition to the feature of the teo in a "living-radical-polymentzation method", an organio haloganeted compound or a sulfonyl lexibility of a design of an initiator or a catalyst being large (meta), it is still more desirable. 117 s functional group conversion reaction etc. at the end, and has a specific functional group from Matyjaszewski et al. and journal OBU American chemical society (J. Am.Chcm.Soc.) 1995.

As compared with an organic polymer which can improve notably the endurance of this (meta) ecrylic ransfer-radical-polymerization method", elongation may be insufficient and endurance may be bad. seter system copolymer by using on silicon e silicon containing functional group which has three or skeletons, such as a polyoxyalkylene series polymer. Even if it uses on acrylic ester (meta) system system copolymer which has a reactive silicon group (meta) may have low elongation as compared A hardened material produced by hardening a hardenability constituent containing an acrylic ester copolymer manufactured using the above "living-radical-polymerization method" and an "atomwith a hardenability constituent containing an organic polymer which has other principal chain nore hydrolytic bases as a reactive silicon group, and hea other principal chain skeletons, an andurence improvement effect is large.

process using the free radical polymenzing method for having used a chain transfer egent for JP,H3-14088.B. JP.14-5544.B. JP.H6-211922.A. etc. is indicated for example. Although a process which used an atom-transfer-radical-polymorization method for JP.H9-272714.A etc. is indicated, it is not 4s a process of an acrylic ester system copolymer which has a reactive silicon group (meta), a

imited to in particular these.

t is a general formula in an acrylic ester system copolymer which has the above-mentioned reactive

ilicon group (meta) (6): :

secompanying a hydrolysia reaction of a reactive silicon group, and it is a polymer whose stability of a especially (A8) an acrylic ester system copolymer that has a basis expressed with (\mathbb{R}^4 in a formula is estar (meta) system copolymer of a principal chain skeleton in this (A8) ingredient, It has the feature which is excellent in weatherability and chemical resistance, and there is no generation of methanol the same as the above) (meta-) can be used as an ingredient. Heat resistance based on an acrylic nardened material, endurance, and creep resistance are still better.

component contained in a hardened material formed eventually increases especially when a reactive A reactive silloon group of the aforementioned (A8) ingredient may be in an end or an inside of an organic polymer chain, and may be in both. Since effective network chain density of a polymer silicon group is in an end of a polymer main chain, it is desirable from points, like a rubber-like hardened material of high elongation becomes is easy to be obtained with high intensity.

rate, it is more desirable and especially an atom-transfer-radical-polymerization method is preferred. polymerization method is used, since molecular weight distribution is narrow, it is hypoviscosity, and from the ability to introduce a cross-linking functional group into molecular chain terminals at a high As a polymerization method of the aforementioned (A8) ingredient, when a living-radical-

An acrylic aster system copolymer which has the above-mentioned reactive silicon group (meta) may se used alone, and may be used together two or more sorts. An organic polymer which has these reactive allicon groups may be used alone, and may be used to obtain the object to obtain a considerable to a polycosublyone acries polymer which has a reactive allone group, a startured hydrocarbin system polymer which has a reactive allone may be a possible eater.

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system copolymer which has a reactive silicon group (meta), end an organic polymer which blends two or more sorts chosan from a group, ** and others, can elso be used.

hes a reactive alticon group, and an acrylic ester eystem copolymer which has e reactive silicon group (meta), Athough proposed by JP,59-122541 A, JP,83-112642.A, JP,H6-172631.A, JP,H11-116763.A A manufacturing method of an organic polymer which blends a polyoxyalkylene series polymer which etc., it is not limited to in particular these.

group, and an acrylic estor system copolymer which has a reactive silicon group (meta) that stability It is known as compared with a case where a polyoxyalkylene series polymer is independently used for an organic polymer which blends a polyoxyalkylene series polymer which has this reactive allicon for an organic polymer which has this reactive allicon. is bad. Then, the above-mentioned general formula (6) as a polyoxyalkylene series polymer component in the aforementioned organic polymer to blend:

as the above) is used, An organic polymer blended with an ecrylic ester system copolymer (A6) which A polyoxyalkylone series polymer (A5) which has a basis expressed with (R4 in a formula is the same has a reactive allicon group (meta) has outstanding stability, andurance, and oreep resistance based on the (A5) ingredient, while outstanding weatherability end an adhesive property based on an

(A6) A desirable example of an acrylic ester (meta) system copolymer of an ingredient has a reactive silicon group, and e chain is a following general formula substantially (14). ingredient (A6) are shown.

the acrylic ester monomer unit which has an alkyl group of the carbon numbers 1-8 expressed with (e ydrogen atom or a methyl group, and R¹¹ ahow the alkyl group of the carbon numbers 1–8 among a

formule, as for R¹⁰) (meta-), and following general formula (15):

Formule 4]

(— the inside of a formula, and ${
m R}^{10}$ — the above — the same — ${
m R}^{12}$ shows a with a carbon numbers which has a with a carbon numbers of ten or mora expressed alkyl group (meta-). It is the method of of ten or more alkyl group ---) --- to a copolymer which consists of an acrylic ester monomer unit blanding and manufacturing a polyoxyelkylene series polymer which has a reactive silicon group.

ss R¹¹ of said general formula (14) — the oarbon numbers 1–8 of a methyl group, an ethyl group, a

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group of 1–2 ie raised still more preferably. An alkyl group of \mathbb{R}^{11} may be independent and may be mixed two or more sorts. as R¹² of said general formula (15) -- ten or more carbon numbare of a leuryl group, a tridocyl group, a cetyl group, a stearyl group, a behenyl group, etc. -- usually --- 10-30 --- a long-chein alkyl group of 10-20 is raised preferably. Like a case of R¹¹, an alkyl group of R¹² may be independent and may

nonomoric unit of a formula (14) which exists in this copolymer, and a formula (15) surpasses 50 % of Although a chain of a ** (meta) acrylic ester system copolymer consists of a monomeric unit of a formula (15) substantially, a "real target" here means that the sum total of a

se mixed two or more sorts

the weight. The sum total of a monomeric unit of a formula (14) and a formula (15) is 70 % of the weight or more preferably.

As for an abundance ratio of a monomeric unit of a formula (14), and a monomeric unit of a formula (15), 95:5-40:60 are preferred at a weight ratio, and 90:10-60:40 ere still more preferred.

groupe, such as glycidyl ecrylate end glycidyl methacrylate, Diethylamino ethyl acrylate, diethylamino formula (15), For example, acrylic acid, such as acrylic acid and methacrylic acid; Acrylamids, Amido As monomeric units other than a formula (14) which may be contained in this copolymer, and a groups, such as methacrylamids. N-methylolacrylamide, and N-methylolmethacrylamide, Epoxy

ethyl methacrytate. A monomer containing amino groups, such as aminoethyl vinyl ether, a monomerio unit which originates in acrylonitrile, styrone, alpha-methylistyrene, alkyl vinyl ether, VCM/PVC, vinyl scetate, vinyl propionate, ethylene, etc. in addition to this is raised.

has a reactive silicon group, and an acrylic cater system copolymer which has a reactive silicon group (meta) is proposed by JP,H1-168764A, JP,2000-186176A, etc., It is not limited to in particular these. Although an organic polymer which blends a saturated hydrocarbon system polymer which

which blends an acrylic ester system copolymer which has a recctant silicon functional group (meta) A method of polymerizing an acrylic ester (meta) system monomer elsewhere under existence of an vrganic polymer which has a reactive silicon group as a manufacturing method of an organic polymer cen be ueed. Although this menufacturing method is concrataly indicated by sech gazetta, euch as JP,59-78223,A, JP,59-168014,A, JP,60-228516,A, and JP,60-228517,A, it is not limited to these. In this invention, allicate can be used as a (B) ingradient. This silicate has the function to inprove the stability of an organio polymer which is the (A) ingradient of this invention, andurence, and creep

(B) Silicate which is an ingredient is a general formula (16). resistance. [0151]

SKOR¹³) 4 (16)

the inside of a formula, and R1³ — respectively — independent — a hydrosen etcm or an alfold group for the carbon marbors 1–21, they are an artifogroup of the enterior numbers 1–20, and the univolent for the carbon marbors 1–20, and the univolent hydrosent from an arially group of the author numbers 1–20. They are letter letter and the carbon numbers 1–20. They are letter letter and the carbon numbers 1–20. They are letter letter and the carbon numbers 1–20. They are letter let alkoxysilane expressed or its partial hydrolysis condensate.

trimethoxysilans, dimethoxy diethoxysilans, methoxy triethoxysilans, Tetra alkoxysilans (tetraalkyl silicete), such as tetre n-propoxysilane, tetra i-propoxysilane, tetre n-butoxysilane, tetra i-4s an example of silicate, for example A tetramethoxy silane, a tetraethoxysilane, Ethoxy

since a partial hydrolyeis condensate of tetre alkoxysllane has an improvement offect of the etability outoxysilane, and tetra t-butoxysilane, and those partial hydrolysis condensates are raised.

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JP,2006-316287,A [DETAILED DESCRIPTION]

of this invention, endurance, and creep resistance larger than tetra alkoxysilane, it is preferred.

A thing which was made to add end carry out partial hydrolysie of the water to tetra alkoxysilane by a usuel method as a partial hydrolysis condensate of said tetra silkoxysilans for exemple, and was made to condense is raised. A commercial thing can be used for a partial hydrolysis condensate of an ORGANO silicate compound. As euch a condensate, the methylsilicate 51, the ethyl eilicate 40 (all are made in Col Coat), etc. ere mentioned, for example.

Silicate (B) shows an improvement effect of still better stability, endurance, and creep resistance by combining with an ingrodient (A1) of this invention, an ingredient (A2), and the (A3) ingredient By combining with an ingrodient (A1) especially shows an improvement offset of good stability. endurance, and creep resistance.

range, an improvement effect of stability, endurance, and creep resistance may not be enough, and a cure rate may become slow if loadings of the (B) ingredient exceed this range. The above-mentioned ellicate may be used only by one kind, and may carry out two or more kind mixing use. section, and also 1 - 5 weight section is preferred. (B) If loadings of an ingredient are less than this B) As amount of ingredient used, 0.1 - 10 weight section is preferred to (A) ingredient 100 weight

reeistanco can be improved by using this cerboxylic acid tin selt ea e silanol condenention catalyst of silanol condensation catalysts, the stability of a hardened material obtained, endurance, and creep in this invention, carboxylic sold tin salt can be used as a (C) ingredient. As compared with other

Limitation in particular does not have carboxylic acid tin salt (C) used for this invention, and various en organic polymer which is an ingradient (A1) of this invention. kinds of compounds can be used for it.

including carbonyl carbons, and carboxylic acid of a hydrocarbon system of the carbon numbers 2-20 As carboxylic acid which has an acid radical of carboxylic acid tin salt (C) here, a carboxylic acid group content compound of a hydrocarbon system of 2-40 is suitably used for a carbon number may be especially used suitably from a point of availability.

acid, 2-hydroxytatradecanoio acid, IPURORU acid, 2-hydroxyhazadecenoic acid, YARAPI Norfan acid, uni-PERIN acid, AMBURETTORU acid, ARYURITTO acid, 2-hydroxycotadecenoic acid, 12-Enanthic acid, caprylic acid, 2-ethylhexanoic acid, pelargonic acid, capric acid, Undecanoic acid, lauric Polyene unsaturated fatty soid, such as decesshexeenoic soid. 1-methylbutyric soid, isobutyric soid. 2-ethylbutanoic soid, isovaleric soid, tuberculostearic soid, Branch fatty soid, such as a pivalic soid and neo decanoic acid; PUROPI all acid, a tarinic acid, fatty acid with triple bonds, such as steer roll acid, a tarinic acid, and 7-hexa crepe-do-Chine acid, Naphthenic acid, A acid, and 7-hexa crepe-do-Chine acid, Naphthenic acid, A as goriic acid, Acetoacctic acid, ethoxyacetic acid, Glyoxylic acid, glycolic ecid, gluconic acid, sabinic unsaturated fatty acid, such as crotonic acid, isocrotonic acid, and 10-undecencie acid. Reno elaidie ecid, Linolic acid, 10,12-octadecadienoic acid, HIRAGO acid, alpha-eleostearic acid, bota-eleostearic 4,8,11,14-hexadeca tetraenoic acid, MOROKUCHI scid, steer RIDON scid, arachidonic soid, 8, 12 and malvalio acid, sterculio acid, HIDONO carbyne acid, chaulmoogric acid, Alloyclic carvone acids, such acid, Tauzue acid, FLETERIN acid, myristolein acid, 2-hoxadeoenoic acid, e-hoxadeoenoic acid, haradeoenoic acid, haradeoenoic acid, pantitoloic acid, petroselionis acid, toller acid, salde acid, sal When it illustrates concretely, seetle acid, propionic acid, butanoic acid, a valeric acid, caproic acid, soid, Straight chain eatureted fatty ecid groups, such as RAKUSERU soid; Undacylonio acid, Linder ronadecanoto acid, arachin acid, Behenio acid, lignoceric acid, cerinio acid, montanic acid, melissic 16, 19-docosatetracnoic acid. 4,8,12,15,18-cicosapentaenoic acid. clupanodonic acid, herring acid. acid, punicio acid, linolenio acid. 8 and 11, 14-eicosatrionoic acid. A 7,10,13-docosatrienoic acid. soid, KISHIMEN soid, RUMEKUEN soid, sorylic soid, methscrylic soid, angelic soid, Monoene ecid, tridecylacid, myristic sold, pentadecyl scid, Pulmitic scid, heptadecylscid, stesrio acid. nydroxyoctadecanoic ecid, 18-hydroxyoctadecanoic acid, 9,10-dihydroxyoctadecenoic http://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http#3A#2F#2Fwww4.ipdl1... 2010/04/30

JP.2006-316287,A [DETAILED DESCRIPTION]

Daygensted fatty soid, such as recinoleic soid, cam ROREN soid, licanic soid, ferron soid, and perebronic acid; a halogenation object of monocarboxylic acid, such as chloracetic acid, 2-

taconic acid, etc. are mentioned. As aliphatic polycarboxylic acid, tricarboxylic acid, such as aconitic nentioned. In addition, amino soid, such as an alanine, leucine, threonine, aspartic soid, glutamic soid, sopropylbenzoic acid, salicylic acid, and toluic acid; aromatic polycarboxylic acids, such as phthalic phoroacrylic acid, and chlorobenzoic acid, etc. are mentioned. As aliphatic dicarboxylic acid. adipio acid, isophthalic acid, terephthalic acid, carboxyphenyl acetic acid, and pyromellitic acid, etc. are unsaturated dicarboxylic soid, such as maleic soid, fumaric soid, scatylans dicarboxylic soid, and sold, citrate, and isocitric sold, etc. are mentioned. As aromatic carboxylic sold, benzolo sold, 9anthracene carboxylic acid, Aromatic monocarboxylic acids, such as atrolactinic acid, anisic acid, acid, azelalo acid, pimelic acid, Saturation dicarboxylic acid, such as SUPERIN acid, sebacic acid, sthylmalonic acid, glutaric acid, oxalic acid, malonic acid, auccinic acid, and oxydiacatic acid; arginine, oystein, methionine, phenylalanine, tryptophan, and histidine, is mentioned.

good to said carboxylic acid has 2-ethylhexanoic acid, octylic acid, neo decanoic acid, oleic acid, or specially acquisition is easy, and is cheap and a point that compatibility with an ingredient (A1) is preferred naphthenio acid. [0161]

workability — bad). Therefore, as for the malting point of said carboxylic acid, it is preferred that it is 65 ** or less, it is more preferred that it is -50-50 **, and it is preferred that it is especially -40-55 when the melting point of said carboxylic acid is high (orystallinity is high), the malting point becomes high in a similar manner, and it is hard to deal with carboxylic soid tin salt which has the soid radical

iquefied and carboxylic acid tin salt which has the acid radical becomes a thing which has a high solid extended a constituent thinly, volatilization by heating may be large and catalyst ability of carboxylic numbers including carbon of a carbonyl group are 2-20, it is more preferred that it is 6-17, and it is nostly an ingredient which volatilizes easily with heating. Especially on conditions (thin layer) which state or viscosity and which is hard to deal with it (workability -- bad). On the contrary, when a carboxylic acid metal salt may fall [carboxylic acid tin salt which has the acid radical], including sold metal salt may fall greatly. Therefore, as for said carboxyllo acid, it is preferred that carbon when a carbon number of said carboxylic acid is large (a molecular weight is large), it becomes carbon number of said carboxylic acid is small (a molecular weight is small), catalyst ability of 0163

carboxylic soid tin salt to dicarboxylic soid or monocarboxylic soid, and it is more preferred that it is It is proferred that it is the tin salt of a point of the ease (workability, viscosity) of dealing with it of tha tin salt of monocarboxylic acid. [0165] preferred that it is especially 8-12 0164

As said monocarboxylic acid tin salt, it is a general formula (17). :

Sn(OCOR) 2 (17)

The inside R of a formula is substitution or an unsubstituted hydrocarbon group, and may include a barbon carbon double bond.) Two RCOO-bases may be the same and may differ. A divalent Sn compound expressed or general formula (18):

It is the same as the above the inside R of a formula.) Two RCOO-bases may be the same and may iffer. A tetravalent Sn compound expressed is preferred. A divalent Sn compound expressed with a general formula (17) from a point of hardenability and availability is more preferred. carboxylic acid tin salt (neo decanolo acid tin.) in which said carboxylic acid tin salt (C) is carboxylic position of a carboxyl group is the 3rd class carbon Pivalio-acid tin etc. are more preferred from a soid tin salt (2-ethylhaxanoic acid tin etc.) and the 4th class carbon whose carbon of an alpha

cura rate baing quick, and aspecially carboxylic acid tin salt whose carbon atom which adjoins a carbonyl group is the 4th class carbon is preferred. nttp://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http53A%2F%2Fwww4.ipdLi... 2010/04/30

especially in this invention, carbon of an alpha position of a carboxyl group uses carboxylic acid tin salt which is the 4th class carbon as an ingredient (C1) in carboxylic acid tin salt (C).

(C1) As carboxylic acid tin salt of an ingradiant, it is a general formula (19).

Formula 5)
$$\begin{pmatrix}
R^{14} & C & C \\
R^{15} & C & C & C
\end{pmatrix} = Sn (1)$$

among the formule, R14, R15, and R16 are the independent substitution or unsubstituted univalent organic groups, respectively, and may contain the carboxyl group.) --- the chain fatty acid tin expressed or general formula (20): 0170

among the formula, an organic group univalent [substitution or unsubstituted] in \mathbb{R}^{17} and \mathbb{R}^{18} are substitution or unsubstituted divalent organic groups, and the carboxyl group may be included. raspectively.) — and ganaral formula (21):

Formula 7]

oivalio acid, 2,2-dimethylbutanoic acid, 2-ethyl-2-methylbutyric acid, 2,2-diethylbutanoic acid, A 2,2the carboxyl group.) --- cyclic-fatty-acid tin containing the structure expressed is mentioned. If the decanoic acid, BASA tio aoid, Chain monocarboxylic acid, such ss 2,2-dimethyl- 3-hydroxypropionic (among the formula, R¹⁹ is a substitution or unsubstituted trivalent organic group, and may contain carboxylic acid which has an acid radical of carboxylic acid tin salt (C1) is illustrated concretely, A ocid, Dimethylmalonio acid, ethyl methylmalonic acid, diethylmalonic acid, 2,2-dimethyl amber acid. dimethylvaleric acid, a 2-ethyl-2-methylvaleric acid, a 2.2-diethylvaleric acid, 2,2-dimethylhoxana soid, 2,2-diethylhexanolc soid, 2,2-dimethyloctanolc soid, 2-ethyl-2,5-dimethylhexane soid, neo Chain dicarboxylic soid, such as 2,2-disthyl amber acid and 2,2-dimethylglutaric acid, Chain nttp://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdli... 2010/04/30

tricarboxylic soid, such as 3-methyliso oitrata and 4,4-dimethylaconitic soid, 1-mathylcyolopentanecarboxylic soid, 1,2,2-trimethyl 1,3-cyclopentane dicarboxylic soid, 1-

mathyloppelmearacynic laed il, 2-forthrolly II 3-oppelment desirably clearly.

Interpolation are devolvic and Z-methylbiolog(Z21)—F hepten—F-carbonylic and Z-methylmethyloppelmeara erchonylic and Z-methylbiolog(Z21)—F hepten—F-carbonylic and Z-methylpelmental are devolvic and z-methylbiolog(Z21)—F hepten—F-carbonylic and z-methylogic and z-

[2017.2] point that compatibility with an ingredient and workelding are expecially (A1) good timenocatrocylete is more preferred Since monocatrocylete is more preferred Since acquisition is easy, pivalic-valed thin, no decunio, add the IA-XX to said this 2-2' directly force acquisition is easy, pivalic-valed thin, no decunio, add the IA-XX to IA-XX to

icid tin, especially 2-ethyl-2,5-dimethylhexane acid tin, etc. are preferred.

 (017)

(or on extern number of carboxylin acid which has an acid radical of an ingredient (01), it is preferred that the carbox of the carbox

expected that it is confirmed that the confirmed that is of the confirmed that it is expected to the confirmed that it is expected by the confirmed that it is confirmed to the confirmed that it is easy to become a solid state (Al) and catalytic activity may full if a carbon under increases once that this matter, it is not desirable. It is not confirmed to the confirmed that it is not desirable. It is not confirmed to the confirmed to confirmed that is there are two carbon numbers.

 (C) As amount of an ingredient and (C1) ingredient used, about 0.01-00 weight sections are preferred (C) As amounts of an overlie section, and tale obtain OF 0.00 weight sections are preferred Since a cure rate question become oleve and a hardward section will become fully difficult to acknow if backing as sets than this result, it is not destinate. On the other hand, if inothing section describes many, weights file becomes about boo muck, and workshilly may werear, and it is not destinate from soften or file becomes about boo muck, and workshilly may werear, and it is not destinate from

storage stability. [DI80] The (O) ingredient and (CI) an ingredient can be used combining two or more sorts besides using it

(0)(81) On the other hand, only of the (O) ingradient and (C1) an ingredient, activity is low, and when moderate hardenability is not acquired, an amine compound can he added as a co-catalyst

[D) (192]
As various amine compounds, although indicated to JP HE-28/181A, for example. Specifically As various a children in a prospilatine, a butylamine, a butylamine, a butylamine, brotydnimne, a butylamine, and a policy series primary amine, auch as Sept less mine, a starylamine, and cyolobroylamine. Promethylamine, series primary amine, and se Sept less mine, a starylamine, and cyolobroylamine. Promethylamine and a policy and a

Designations united use that Set Bell senior stronghame in or option/proteiner Dentalphium, Dentalphium, Designation of profession and option of the Control of the Control

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dimethylethylendiamine, Triethylanodamine, gaaniden, diphenylgamidine, MAIN, and W-detramethyl (15-butanediamine, NMN, W-tetramethyl striblene diamine, 24-8-f-triedimethyla minomethyl) phanol, Although morpholes, W-marylanopholma, 2-ethyl-f-methylmidatoole, 1, and 8-diazabisyolo (5, 4, 0) molecoep 2 (QBD) set, as en entitioned, it is not finited to these. After leading or gual anima consoural, date to 00-10-10 events excelve are operated to vegether of the operate of the operate of 00 vegeth exection of an ingredient (AI), and also fits 01 to 5 vegeth exelction in more operated. As over sers any become it do that I keep delight of an inniv compound we leave than 0.01 veryight exelction, and a landering reaction becomes folly difficult to advance. On the other hand, if loading of an amine consourand accessed 20 veglet excelven, and other o

[0184] In this inventor, an organic tin catalyst can be used as a (D) ingrodent. When this organic tim catalyst is used as a sincel condensation catalyst of an argue to purer with the as a restude to allowing anything a compared with other stilled condensation catalysts, a insteadability constituent with high earbitic activity, and a compared with the catalysts and a constant of the catalysts and a constant of the catalysts and a constant of the work.

The area of the catalysts and a constant of the catalysts and a constant of the work.

The area of the catalysts area of the catalysts and a catalysts and a constant of the work.

The translation constituent obtained endemnos, and crosp resistence full.

[D165]

The Amenicality constituent which select an organic for unsubject of the Oil ingredient by using an organic popular organic polymer which is an ingradient (AI) of this invention as a polymer component. Catalytic confirms describe theigh, an ediginal prediental full, and an addistance preserve year operation and the subsidient of his chained influince than an expensive an expensive and case the subsidient of their chained influince than the subsidient of the constituents and conserved the subsidient of the constituence on its on manifestive of the constituence of the constituen

In safet adhesives or a scaling material which on the other hand, contains an organic polymer which has a masche adiaton to buy as the main ingenities the a masche sufficient purpose is the main regime for the second carbon of the second control of the properties and the set for the second (I) ingestions as a curring category. It is many cases however, if this actions and this safe is more than the set of the additional to be set of the set of the second of mascory joint and a sealing material will remain by a thin agont, it is that its institute that have portion, and may remain on conditione after all only the lands as a curring catalogue, an institutioned above, the set of the hand, it is all organic this catalogue of the thin agon and catalogue of the thin and are all organic for the hand set is good. The set is a curring catalogue as mentioned above, stabilly of an extension of the formation of the hand set is good that the organic polymer and the ID) translates which is an agreedent (Art) of this residence is not considered, and disturbate highly.

Observable and the control and an extent that entropolis end the rate of the control and the c

by your and a seample of said organic tin cetalyst (D), they are dialkyl tin cerboxylate, dislikyl tin oxide, and a general formula (22).:

0,28(OZ) $_{\rm eff}$ or (0,58(OZ)), or (0.2). Or competent of the set functional group with which O can form a consense area of forms an expense area of the set functional group with which O can form a consense area of functional group with which O can form a consense area of functional control of the carbon number 1-20 to So.) is in 0,1.2 or 3.A composition of the set form of the carbon number 1-20 to So.) is in 0,1.2 or 3.A composition for the carbon number 1-20 to So.) is in 0,1.2 or 3.A composition for discount from the control carbon forms 1-20 to So.) is in 0,1.2 or 3.A composition for discount forms are a composition of the set of the set of the carbon forms and only interesting also in recentar with bow molecules allow compound dispendent-box siles or a set therefore set on the carbon set of the consentation of the control and produced forms of the composition of the composition of the carbon forms are a therefore composition of the compositi

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As an example of said dailey! in ant-boxylate, For example, debuythn dilaurate, debuythin dianoetake, a dianoty it is dephysionar area, Dibuth of MOVITETO, dabuyth in dienbylmine, dabuyt his debuyth misse, Dieucky is debuyt maletra, debuyt in dianoedy maleta, Dibuth vin deflected maleta, dibuth his dibursty maleta, dibutythin maleta, dioucky in dianoetake, dooryl tri dieterenta, dioutyl tri dieterenta, diout dioctyl tin diethyl malate, dioctyl tin diisooctyl malate, etc. are mentioned. [0190]

As an example of said dialkyl tin oxide, dibutyl tin oxide, dioctyl tin oxide, a mixture of dibutyl tin oxide and phthalic ester, etc. are mentioned.

said ohelate compound is illustrated concretely.

Formula 8 0192

Although ** is mentioned, it is not limited to these. In these, its catalytic activity is high, and it is low cost, and since dibutyl tin bissoetylacetonate is easy to receive, it is the most preferred

ff said tin alcoholates are illustrated concretely, [0195] 0194]

Formula 9]

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(C4H₉) ₃Sn0CH₃

(C4H₉) 2Sn (0CH₃) 2

C4H9Sn (OCH3) 3

Sn (0CH₃) 4

(C4Hg) 2Sn (OC3H7) 2

(C4H₉) ₂Sn (0C₄H₉) ₂

(C4H₉) ₂Sn (OC₁₂H₂₅) ₂ (C4H₉)₂Sn (0C₈H₁₇)₂

(C₈H₁₇)₂Sn (OCH₃)₂

 $(C_4H_9)_2Sn(0\langle Q)_2$

(C4H9) 2Sn (O () 2

[(C4H₉) 2Sn] 20

Although ** is mentioned, it is not limited to these. In these, a dialkyl the JIARUKOKI side is preferred. Especially the dibutsyl tin JIMETOKI side is low cost, and since it is easy to receive, it is

JP.2006-316287,A [DETAILED DESCRIPTION]

(D) As amount of ingradient usad, about 0.01-20 waight sactions are preferrad to ingradient (A1) 100 range, it is not desirable. On the other hand, if loadings exoced this range, working life becomes short weight section, and also about 0.1-10 weight aactions are preferred. Since a oure rate may become slow and a hardoning reaction will bacome fully difficult to advance if loadings are less than this so much, and workability may worsen, and it is not desirable from a point of storage stability.

exceed this range, working life becomes short too much and workability may worsen. (D) The stability When loadings of an ingredient are less than this range, a cure rate may become slow, when loadings ngredient.0.01 - 10 weight section to ingredient 100 weight section, and also it is more preferred to nardenability, an adhesive property, and thin layer hardenability may not be enough if loadings of an ngredient are less than this range, and loadings exceed this range, endurance, and creep resistance As amount of [in case used of using the (D) ingredient and the (C) ingredient together as a ouring catalyst], (A1) it is preferred to consider it as (C) ingredient 0.5 - 20 weight soction and (D) consider it as (C) ingredient 1 - 10 weight section and (D) ingredient 0.02 - 5 weight section. (C) of a hardened material which will be obtained if an improvement effect of hardenability, depths nay worsen.

The (D) ingredient can be used combining two or more sorts besides using it alone.

in this invention, a non-tin catalyst can be used as a (E) ingradient. This non-tin catalyst has a function which improves the stability of a hardened material obtained, endurance, and creep resistance as compared with other silanol condensation catalysts, when it uses as a silanol 0200]

As a non-tin catalyst which is the (E) ingredient which can be used for this invention, although there condensation catalyst of an organic polymer which is an ingredient (A1) of this invention. A non-tin patalyst which is the (E) ingredient is an eco-friendly ouring catalyst with high social needs.

is no restriction in particular, an organic metallic compound containing carboxylic acid, carboxylic acid metal salt other than carboxylic acid tin salt, organic sulfonio acid, alkyl acid phosphate and 3B follows, and 4A group metal, etc. are illustrated. 0202

he various above-mentioned carboxylic acid which has an acid radical of carboxylic acid tin saft which is the (C) ingredient as carboxylic acid can ba illustrated.

that it is especially 8-12. A point to dicarboxylic acid or monocarboxylic sold of the case (workability, noluding carbon of a carbonyl group are 2-20, it is more praferrad that it is 6-17, and it is preferred viscosity) of daaling with it of carboxylic acid is praferred, and monocarboxylic acid is more praferred carboxylic acid (neo decanoic acid.) in which said carboxylic soid is carboxylic acid (2-ethylhexanoic icid etc.) and the 4th class carbon whose carbon of an alpha position of a carboxyl group is the 3rd class carbon A pivalic acid etc. are more preferred from a cure rate being quick, and especially As for said oarboxyllo sold, it is proferred like carboxylic sold tin salt (C) that carbon numbers

carboxylic acid whose carbon atom which adjoins a carbonyl group is the 4th class carbon is

Especially as carboxylic acid, 2-cthylhexanoic acid, neo decanoic acid, BASA tic acid, 2.2-dinethyloctanoic acid, and 2-ethyl-2.5-dimethylhexane acid are preforred from a point of availability, nardenability, and workability.

4s carboxylic aoid metal salt other than said carboxylic acid tin salt, metal salt of the various abovenentioned carboxylic acid can be used conveniently.

in carboxylo acid metal salt other than said carboxyle acid in salt, carboxyle acid bismuth, Carboxylo said calcium, achoxylos acid varsadium carboxylo acid iron, carboxyle acid thanium. Carboxylos acid otetassium, autoxylos acid barium, carboxylos acid inarganese, carboxyle acid inkel. Carboxylos acid otetassium, autoxylos acid barium, carboxylos acid inarganese, carboxyle acid inkel.

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carboxylic soid cobalt, a carboxylic scid zirconium, and carboxylic soid cerium. From a high point, tha carboxylic acid titanium, and a carboxylic acid zirconium are still mora preferred, and carboxylic acid acid vanadium, carboxylic acid iron, carboxylic acid titanium, carboxylic acid potaasium, Carboxylic activity of a catalyst is preferred and Carboxylic acid bismuth, carboxylic acid calcium, Carboxylic Carboxylic soid bismuth, carboxylic soid calcium, carboxylic soid vanadium, carboxylic acid iron, gold barium, carboxylic acid manganese, and a carboxylic acid zirconium are more preferred.

bismuth, carboxylic acid iron, and oarboxylio acid titanium are especially the most preferred.

Carboxylic acid bismuth, carboxylic acid calcium, carboxylic acid vanadium. Carboxylic acid titanium. carboxylic acid barium. carboxylic acid marganese, carboxylic acid nickel. material and weatherability which are obtained are high, and carboxylic acid bismuth, carboxylic acid osicium, carboxylic acid carboxylic acid barium, and a carboxylic acid barium, and a carboxylic coloring of a hardenability constituent obtained, and a point that the heat resistance of a hardened carboxylic acid cobalt, and a carboxylic acid zirconium, It is more desirable from a point with little

It is more preferred that it is metal salt of a point of the case (workability, viscosity) of dealing with it of carboxylic acid metal salt to monocarboxylic acid.

soid ziroonium are still more preferred.

As said monocarboxylic soid metal salt, it is general formula (23) - (35).

Ca(OCOR), (24) BI(OCOR), (23)

Fe(OCOR) 2 (26) V(OCOR), (25)

Fe(OCOR) 3 (27)

Ti(OCOR) 4 (28)

nickel(OCOR), (32) Mn(OCOR) 2 (31) 3a(OCOR) 2 (30) ((OCOR) (29)

Zr(0) (0000R) , (34) 3o(OCOR) 2 (33)

The inside R of a formula is substitution or an unsubstituted hydrocarbon group, and may include a parbon carbon double bond.) Two RCOO-bases may be the same and may differ. Carboxylic soid Ca(OCOR) 3 (35)

metal salt expressad ia preferred.

As a carboxylic acid group of carboxylic acid metal salt other than said carboxylic acid tin salt, an acid radical of various carboxylic acid tin salt illustrated as the aforementioned (C) ingredient can be 0210]

From a vicepoint of the availability of a raw material, and compatibility, as an example of desirable carboxylic acid metal salt, 2-ethylhexanoic acid bismuth (trivalent). 2-ethylhexanoic acid iron 0211

ethylhexanoic acid vanadium (trivalent), 2-ethylhexanoic acid calcium (divalent), 2-ethylhexanoic acid sthylhexanoic acid zirconium (tatravalence), 2-ethylhexanoic acid cerium (trivalent), neo decanoic decanoic acid titanium (tetravalance), Nac decanoic acid vanadium (trivalent), nac decanoic acid soid bismuth (trivalant), Neo decanoio acid iron (divalent), neo decanoic acid iron (trivalent), neo oalcium (divalent), Neo decenoio soid potassium (univalent), neo decenoio soid barium (divalent), neo decanoic acid zirconium (tetravalenca). Neo decanoic acid cerium (trivalent), bismuth oleate (divalent), 2-ethylhexanoic acid iron (trivalent), 2-ethylhexanoic acid titanium (tetravalence), 2potassium (univalent), 2-ethylhexanoic acid barium (divalent), 2-ethylhexanoic acid manganese (divalent), 2-ethylhexanoic acid nickel (divalent), 2-ethylhexanoic acid cobalt (divalent), 2nttp://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http#3A%2F%2Fwww4.ipdli... 2010/04/30

trivalent), oleic esid iron (divelent), oleic esid iron (trivalent), oleic esid titanium (tetravalence), oleic soid vanadium (trivalent), Oleic esid calcium (divelent), oleic esid potassium (univalent), oleic esid

(tetravalence), Naphthenic acid vanadium (trivalent), calcium naphthensta (divalent), naphthenic acid perium (divalent), Manganese oleste (divalent), oleic soid nickel (divalent), oleic soid cobalt (divalent). An oleic acid zirconium (tatravalence), cieic acid cerium (trivalent), naphthanic acid bismuth (trivalent), Naphthanic acid ircn (divalent), naphthanic acid tranium potassium (univalent). Naphthenic acid barium (divalent), manganese naphthenate (divalent). naphthenic acid nickel (divalent), cobalt nephthenate (divalent). a naphthenic acid zirconium

(tetravalence), naphthenic soid cerium (trivalent), etc. are mentioned. [0212]

ron (divalent), 2-ethylhexanoic acid iron (trivalent), 2-ethylhexanoic acid titanium (tetravalence). Neo soid iron (trivalent), oleic acid titanium (tetravalence), naphthenic acid bismuth (trivalent), Naphthenic Jecanoic acid bismuth (trivalent), neo decanoic acid iron (divalent), neo decanoic acid iron (trivalent). Veo decanoio acid titanium (tetravalence), bismuth oleate (trivalent), oleic acid iron (divalent), Oleic 2-ethylhexanoic acid bismuth (trivalent) from a viewpoint of catalytic activity, 2-ethylhexanoic acid acid iron (divalent), naphthenic acid iron (trivalent), and naphthenic acid titanium (tetravalence) are more preferred, and 2-ethylhaxanoic acid iron (trivalent), neo decanoic acid iron (trivalent), and especially naphthenic acid iron (trivalent) are preferred. [0213]

2-ethylhexanoic edid bismuth (trivalent) from a viewpoint of coloring, 2-ethylhexanoic acid titanium (tertavelance), 2-ethylhexanoic acid calcium (divalent), 2-ethylhexanoic soid potașaiium (univalent), 2-(setravalence), caloium naphthenate (divalent), naphthenic acid potassium (univalent), naphthenic acid decanoic acid zirconium (tetravalence), Bismuth cleate (trivalent), cleic acid titanium (tetravalence), oloic acid calcium (divalent). Oloic acid potassium (univalent), oloic acid berium (divalent), an oloic sthylhexanoic ecid barium (divalent), 2-ethylhexanoic acid zirconium (tetravalence), Neo decanoic divalent), neo decenoic scid potassium (univalent). Neo decenoic scid barium (divalent), a neo soid bismuth (trivalent), neo decanoic acid titanium (tetravalence). Neo decanoic acid calcium acid zirconium (tetravelence), Naphthenic acid bismuth (trivelent), nephthenic acid titanium

barium (divalent), and a nephthenic acid zirconium (tetravalence) are more preferred. oluenesulfonic acid, styrene sulfonic acid, etc. are raised as organic sulfonic acid. 4kyl acid phosphate is -0-P (=0) OH. It is phosphoric ester containing a portion and elkyl acid phosphate as shown below is contained. An organic acid nature phosphoric ester compound is preferred in respect of compatibility and curing catalyst activity. An organic ecid netura phosphoric ester compound is expressed with h(R²⁰-O)-P(=O) (-OH) _{3-h} (in

the inside h of a formula, 1 or 2, end \mathbb{R}^{20} show an organic residue).

 $\mathsf{OH})_{2} \ \mathsf{and} \ {_2}(\mathsf{G_8H_{17}O}) - \mathsf{P} \ (=0) \ (-\mathsf{OH}). \ (\mathsf{G_8H_{17}O}) - \mathsf{P} (=0) \ (-\mathsf{OH}) \ {_2}^- \ (\mathsf{G_{10}H_{21}O}) \ {_2}^- \mathsf{P} \ (=0) \ (-\mathsf{OH}). \ (\mathsf{G_{10}H_{21}O}) - \mathsf{P} (\mathsf{G_{1$ and $_2(G_3H_7O)-P$ (=0) (-0H), $(G_3H_7O)-P$ (=0) (-OH) $_2$ and $_2(G_4H_9O)-P$ (=0) (-OH), $(G_4H_9O)-P$ (=0) (-OH) (-OH) (-OH) (-OH) (-OH) $P(=0)\;(-OH)\;_{2}\;(G_{13}H_{27}O)\;_{2}-P\;(=0)\;(-OH),\;(G_{13}H_{27}O)-P(=0)\;(-OH)\;_{2}\;\text{and}\;_{2}(G_{16}H_{33}O)-P\;(=0)\;(-OH),\;(G_{13}H_{27}O)-P(=0)\;(G_{13}H_{27}O)-P(=0)\;(G_{13}H_{27}O)-P(=0)\;(G_{13}H_{27}O)-P(=0)\;(G_$ OH) (CHOH) OJ-P(=0) (-OH) $_2$. Although ((CH $_2$ OH) (CHOH) $_2$ H $_4$ O) $_2$ -P (=0) (-OH) and ((CH $_2$ OH) (CHOH) (CHOH) $_2$ -P (=0) (-OH) and ((CH $_2$ OH) (CHOH) (CHOH CHOH) G_2H_4 OJ-P(=0) (-OH) $_2$ etc. are reised, it is not limited to the above-mentioned illustration $C_{g}H_{16}$ 0)-P (=0) (-0H), (HO- $C_{g}H_{16}$ 0)-P(=0) (-OH) $_{z}$, (IGH $_{z}$ OH) (GHOH) 0] $_{z}$ -P (=0) (-OH), (IGH $_{z}$ $(\mathrm{CH_3O}) \ _2^{-\mathrm{P}} \ (=\!0) \ (-\mathrm{OH}) \ (\mathrm{CH_3O}) - \mathrm{P}(=\!0) \ (-\mathrm{OH}) \ _2 \ (\mathrm{C_2H_5O}) \ _2^{-\mathrm{P}} \ (=\!0) \ (-\mathrm{OH}) \ (\mathrm{C_2H_5O}) - \mathrm{P}(=\!0) \ (-\mathrm{OH}) \ (-\mathrm$ (C₁₆H₃₃O)-P(=0) (-OH) 2, (HO-C₆H₁₂O) 2-P (=O) (-OH), (HO-C₆H₁₂O)-P(=O) (-OH) 2, (HO-Below, it illustrates concretely.

By cerboxylio acid, carboxylic ecid metal salt other than cerboxylic acid tin selt, organic sulfonic acid, and alkyl ecid phosphata, activity is low, and when moderate hardenability is not acquired, an amine nttp://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdl.i.. 2010/04/30

compound can be added as a co-catelyst

JP,2006-316287,A [DETAILED DESCRIPTION]

As various emine compounds, the indicated various above-mentioned emine compounds cen be used as a co-catalyst of carboxylic soid tin salt (C).

loadings of an amine compound exceed 20 weight sections, pot life may become short too much and preferred. A cure rate may become it slow that loadings of an amine compound are less than 0.01 weight sections, and a hardening reaction becomes fully difficult to advance. On the other hand if As for loadings of said amine compound, about 0,01-20 waight scotions are preferred to organic polymer 100 weight section of an ingredient (A1), and also its 0.1 to 5 weight section is more is not preferred from a point of workability. 4s a metal system compound of non-tin, besides cerboxylic acid metal salt other than said carboxylic compound, an organic boron compound, etc. are preferred from a point of activity, it is not limited to acid tin salt, An organic metallic compound containing 3B fellows and 4A group metal is raised, and although a titanate organic compound, an organoaluminium compound, an organic zirconium

such as triethanolamine titenate, tilanium tetra acetylacetoneto, titanium athylecetoacetate, octylene As seid titanate organic compound, tatraisopropyl titanate, Tetrabuthyl titanate, tetramethyl titanate, tetra (2-ethylhexyl titanate), Chelate compound, auch as titanium chelate, such as titanium alkoxides, glycolate, and titanium laotate, etc. ere raised.

butoxy aluminum disopropylate and aluminum sec-butyrate. Aluminum chelate, such as aluminum tris As said orgenoaluminium compound, aluminum isopropylate, Aluminum alkoxides, such es mono secacetylecctoneto, aluminumtrisethylacetoacetate, and diisopropoxy aluminum ethylacetoacetate, is

As said ziroonium compound, zirconium tetra isopropanal POKISAIDO, Ziroonium alkoxides, such as a zirconium tetra-n PUROPI rate and zirconium normal butyrate. Zirconium chelate, such as zirconium etre acetylacetonato, zirconium monoecetyl acetonate, zirconium bisacetylacetonats, zirconium

sectylacetonate bis-ethylaceteacetate, and zirconium acetate, is reised.

concomitant use with said annine compound or an elkyl-acid-phosphate compound since it is possible to improve activity, and more desirable in a viewpoint of edjustment of working life in hardenability organoaluminium compound, en organio zirconium compound, an organio boron compound, etc., it is desirable in a viewpoint which can reduce the amount of cetalyst used especially according to Although **** concomitant use is also possible so, these titanate organic compounds, an

and ordinary temparature in an elavated temperature.

range, it is not desirable. On the other hand, if loadings exceed this range, working life becomes short (E) As amount of ingredient used, about 0.01–20 weight sections are preferrad to ingredient (A1) 100 weight section, and also about 0.5-10 weight sections are preferred. Since a cure rate may become slow and a hardening reaction will become fully difficult to advance if loadings are less than this too much, and workability may worsen, and it is not desirable from a point of storage stability. In this invention, a minute hollow body can be used as a (F) ingredient. While improving the workability (******* thixotropy) of a constituent notably as indicated to JP,H11-35923,A or JP,H11-310772.A

The (E) ingredient can be used combining two or more sorts besides using it alone.

if this minute hellow body is used, it is from that a weight setting of a constitution and bow court-izing are perselble. However, it is brown that the stability of a intercend material of a landenballity consisterate and endurance which are obtained will fish according to an edition of this minute hollow

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organic polymer which is an ingredient (A1) of this invention as a polymer component oan maintain righly the stability of a hardened material and endurance which are obtained, improving worksbility The hardenability constituent which added a minuta hollow body of the (F) ingrediant by using an

******* notably.

s very small hollow body (henceforth a balloon) which is the (F) ingredient of this invention is a hollow oody by which a diameter was preferably constituted from material of minerals of 500 micrometers or less or quality of organicity I mm or less as indicated, for example on "state-of-the-art art of a functional filler" (GMC). (F) An ingredient in particular is not limited but it is [ingredient] usable in various kinds of publicly known balloons.

proferred that it is 0.03 – 0.7 g/cm³, and it is preferred that it is especially 0.1 – 0.5 g/cm³. If tensile strength of a hardened material may fall if average particle density is less than this range, and average particle density exceeds this range on the other hand, a workability improvement effect may 4s for average particle density of a balloon, it is preferred that it is $0.01-1.0~\mathrm{g/cm}^2$, it is more not be enough.

An inorganic system balloon is more preferred than a point of stability and andurance to an organic

stc. on a non-silicic acid system balloon. As an example of these inorganic system balloons, as a milt As said inorganic aystem balloon, can illustrata a silicic acid system balloon and a non-silicic acid balloon, fly ash balloons, etc. can illustrate an alumina balloon, a zirconia balloon, a carbon balloon, system balloon, and on a silicic acid systam balloon. A milt balloon, perlite, glass balloons, a silica system balloon. [0233]

ZIRCONIUM SPHEES made from ZIRCOA, KUREKASU fair made from Kureha Chemicals and product CORNING, As GLASS BUBBLES made from 3M, FUJIBA lune made from Fuji SHIRISHIA Chomicals, baloon, a win light by LUCH Oremicals, As a SANRI light by Savid Engineering Co., Ltd. and glass abaloons, KOKINN by Nippon States Glass Co., Ltd. The Saminors by cell stare 7–28 MICROD balloons, KOKINN by Nippon States Glass Co., Ltd. The Saminors by cell stare 7–28 MICROD balloons made from BIRTSONBOUNKIQ, CELAMIC GLASSMODULES made from BIRTSONBOUNCING. TLITE U.S.A, As an alumina balloon, as BW by Showa Denko K.K. and a zirconia balloon HOLLOW Chemicals, and fly ash balloons, CEROSPHERES made from PFAMARKETING, FILLITE made from and a silica balloon, as Q-CEL by Asahi Glass Co., Ltd., SAIRISHIA made from Fuji SHIRISHIA car boss fair made from GENERAL TECHNOLOGIES are marketed as a carbon balloon.

here is made to foam, after blending a thing containing a foaming agent, and is good also as a balloon. balloon, and a styrene acrylic balloon at a thermoplastic balloon. A balloon of thermoplastics which constructed the bridge can also be used. A balloon after foaming may be sufficient, and a balloon system balloon, On a thermosetting balloon, a phenol balloon, an apoxy balloon, and a urea balloon can illustrate a saran balloon, a polystyrene balloon, a polymethacrylate balloon, a polyvinyl alcohol A balloon of thermosatting resin and a balloon of thermoplastics can be illustrated as said organic

ERERSON&CUMING, As a urea balloon. ECCOSPHERES VF-O made from EMERSON&CUMING, As a surea balloon, SARAN MICROSPHERES made from DOW CHEMICAL, Expancel made from Japanese So., Ltd. (P) are marketed by EXPANDABLE POLYSTYRENE BEADS made from BASF WYANDOTE. Filament, the Matsumoto Yushi-Seiyaku Matsumoto microsphere. As a polystyrene balloon, DYLITE EXPANDABLE POLYSTYRENE made from ARCO POLYMERS, SX863 by Japan Synthetic Rubber As an example of these organic system balloons, as a phenol balloon, Union Carbide UCAR and PHENOLIC MICROBALLOONS, As an epoxy balloon, ECOOSPHERES made from

The above-mentioned balloon may be used alone, and two or more kinds may be mixed and it may be used. The surface of these balloons Fatty acid, fatty acid ester, rosin, What was processed in order to improve disparability and tha workability of a compound by roain and lightin a slane coupling. When the support of the complete specific property of the compound of the co

and constructed type styrene acrylic acid balloon of a bridge.

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stiffening a compound, these balloons are used in order to carry out a weight saving and to cut down

As for the amount of balloon used, about 0.1-50 weight sections are preferred to ingredient (A1) 100 weight section, and also its about 0.5-30 weight sections are preferred. When a workability improvement effect may not be anough if loadings are less than this range, and loadings exceed this range, tensile strength of a hardened material may fall or stability and endurance may worsen

At this invention, it is a general formula as a (G) ingredient (7).

- SiR5 (OR⁶) 3-2 (7)

independently, and 3-c R⁶, respectively) It is an organic group of monovalence of the carbon numbors 2-20 independently, and o shows 0, 1, or 2, respectively. An aminosilane coupling agent which has a basis expressed can be used. General formula (8) which is the (A4) ingredient of this invention about Among a formula, c R⁵ is the organic groups of monovalence of the carbon numbers 1-20

While having stability, endurance, and creep resistance outstanding by adding to an organic polymer which has a basis expressed with (R⁴ in a formula is the same sa the above), it becomes a - Si(OR⁴) ₃ (6)

group of this (G) ingredient. Evan if an ester exchange reaction between reactive silicon groups of the silicon atom is 2 to 20, toxic high methanol is not contained in alcohol generated in connection with a G) ingredient and the (A4) ingradient advances after mixing with the (A4) ingradient since it does not have a methoxy group as an alkoxy group combined with a silicon atom, a reactant high methoxy silyl turns into a hardenability constituent with little change of a cure rate. A resctive silicon group of this group does not generate to a reactive silicon group of the (A4) ingredient. Therefore, a hardenability hardenability constituent in which an outstanding acheaiva property is shown. To a reactive silicon (G) ingredient and the (A4) ingredient, Since a carbon number of an alkoxy group combined with a constituent containing the (G) ingredient and the (A4) ingredient is before and after storage, and aydrolysis reaction of a reactive silicon group when a hardenability constituent carries out condensation hardening, but becomes it with a constituent with high safety.

constituent, when it is considered as I figuid type, since said hardenability constituent which consists of an ingredient and a (A4) ingredient has a large effect which makes small especially change of a (G) Aithough it is usable as a many liquid L such as 1 liquid type and a two-component type, I type cure rate in atorage order, it is preferred.

(7), a triethoxy silyl group, a methyldi ethoxy silyl group, a dimethylathoxy silyl group, an ethyldiethoxy G) An ingredient is a compound which has a reactive silloon group expressed with a general formula 7), and an amino group. As an example of a reactive silloon group expressed with a general formula alkoxy group combined with a silicon atom of a reactive silicon group has preferred toxic cthoxy silyl rumber of an altoxy group combined with one alfoon stem of a reactive alliang group, two or more intenses are preferred, and its three objects are more preferred. The bubblish of clothol tensented in connection with a bydrolysis reaction and a violenderit of a sure rate to a triethory ally group in the silyl group, a triisopropoxy silyl group, a methyldi isopropoxy silyl group, etc. can be mentioned. An reaction, and its ethoxy silyl group is more preferred. From a viewpoint of a cure rate, as for the group from a viewpoint or isopropoxy silyl of alcohol generated in connection with a hydrolysis

triisopropoxy silane, gamma-aminopropyl methyddicthoxysilane, gamma-(2-aminoethyl) aminopropyl triisopropoxy silane, gamma-(2-aminoethyl) aminopropyl triisopropoxy silane, gamma-(2-aminoethyl) triethoxysilane, N-vinylbanzyl gamma-aminopropyl triethoxysilane, N.N'-bia/gamma-triethoxy silyl triisopropoxy silane, gamma-urcido propylmethyl diethoxyailane, N-phanyl-gamma-aminopropyl triethoxysilane, N-banzyl-gamma-aminopropyl triethoxysilana, N-n-butyl-gamma-aminopropyl As an example of an ingredient, (G) gamma-aminopropyl tricthoxysilene, gamma-aminopropyl aminopropyl mathyldiethoxysilane, gamma-ureido propyl triethoxysilane, gamma-ureido propyl

most preferred.

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JP.2006-316287,A [DETAILED DESCRIPTION]

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derivetive and a condensation reaction thing of the above-mentioned silene compound can also use pamma-[2-(2-aminocthyl) aminosthyl] aminopropyl triethoxysilane, can be mentioned. A denatured propyl)ethylenediemine, Amino group content Silang, such as bis(triethoxy silyl propyl)amine and he above-mentioned silene compound as a (G) ingredient.

he (G) ingredient used for this invention is used in 0.1-10 copies to 100 copies of organic polymers of the (A4) ingredient. It is preferred to use it in 1-5 copies especially. The above-mentioned (Q) ngredient may be used only by one kind, and may oarry out two or more kind mixing use.

(A4) A dehydrator may be added when using as a 1 liquid type constituent a constituent which consists of an ingredient and a (G) ingredient Especially as said dehydrator, it is not restricted but various kinds of compounds can be used. Since [that a change in physical properties after a silioon

compound which has alkoxy silyl groups and does not contain an amino group as a dehydrator storing by care of health at low temperature comparatively since an ester exchange reaction with a reactive silicon group of the (A4) ingredient is late its small and] the drying effect is high, it is desirable. Since such es the drying effect, hardenability, evallability, and the tension physical properties of a hardened a silicon compound which has the Tori alkoxy silyl groups and does not contain an amino group has the higher drying effect, it is preferred, and especially a silicon compound that has a trincthoxysily! group and doss not contain an amino group is preferred. Specifically, alkyltrialkoxysilane, such as inyltrimetoxysilane, methyl trimetoxysilana, and phenyltrimethoxysilene, is preferrad from points.

At this invention, it is a general formula as a (H) ingredient (8). :

SIR7 (OCH3) (OR®) 3-4-8 (8)

respectively.) However, 3-d-e>=0 shall be satisfied. An aminosilane coupling agent which has a basis expressed can be used. General formula (6) which is the (A4) ingredient of this invention about this independently, respectively, R⁸ of a 3-d-e individual is an organic group of monovalence of the carbon numbers 2-20 independently, and d shows 0, 1, or 2 and, as for e, it shows 1, 2, or 3, Among a formula, d R7 is the organic groups of monovalence of the carbon numbers 1-20

H) ingredient: Si(OR*) 3 (6)

fast curability while having outstanding adhesive property, stability, andurance, and creep resistance. If it is reouperated beforehand, a hardenability constituent added to an organic polymer which has a advances, and a resotant high methoxy silv! group generates to a reactive silicon group of the (A4) ngrediant. A hardenability constituent obtained as a result turns into a hardenability constituent of pasis expressed with (R4 in a formula is the same es the above), (H) An ester exchange reaction between a methoxy silyl group of an ingredient and a reactive ellicon group of the (A4) ingredient

[1945]
Desirable care-of-health conditions of said hardenability constituent which consists of an introduced as the state of the state ts addition, ester exchange reaction activity of a reactive silicon group of the (H) ingredient and the (A4) ingredient, etc., are not generally decided, but as a transesterification catalyst. When it includes temperature service, the 10-30 ** thing for which it is recuperated comparatively one week or more an organic tin catalyst or 0.5 copy - about three copies of Ti system catalysts in a system, in a low s preferred, and it is preferred that more than a day recuperates itself in not less than 30 ** high

constituent, when it is considered as I liquid type, since said hardenability constituent which consists of an ingredient and a (A4) ingradient has a remarkable change of a cure rate especially by care of H) Although it is usable as a many liquid [, such as 1 liquid type and a two-component type,] type

(H) An ingredient is a compound which hee a reactive sillicon group expressed with a general formula (9), and an amino group. As an example of a reactive sillicon group expressed with a general formula health, it is proferred.

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for the number of an alkoxy group combined with one elicon stom of a reactive silicon group, two or more pieces are preferred, and its three pieces are more preferrad. Therefore, a trimethoxysilyl group (8), A trimethoxysilyl group, a methyl dimethoxy silyl group, an ethyl dimethoxy silyl group, an ethoxy methoxy silyl group, etc. can be mentioned. From a viewpoint of ester exchange reaction speed, as dimethoxy silyl group, e dimethyl methoxy silyl group, a diethyl methoxy silyl group, a diethoxy

As an example of an ingredient, (H) gamma-aminopropyl trimethoxysilane, gamma-aminopropyl methyl aminoethyl) aminoethyl aminopropyl trinethoxysilane, can be mentioned. A denatured derivative and a condensation reaction thing of the above-mentioned silane compound can also use the abovegemma-(2-aminoethyl) aminopropyl ethoxy dimethoxysilane, gamma-ureido propyltrimethoxysilane. gamma-trimethoxysily|propyl)ethy|enediamine, bis(trimethoxysily|propyl)amine, and gamma-[2-(2benzył-gamma-aminopropyl trimethoxysilane, N-n-butyl-gamma-aminopropyl trimethoxysilane, Ngamma-ureido propylmethyl dimethoxysilane, N-phenyl-gamma-aminopropyl trimethoxysilane, Nvirylbenzyl gamme-aminopropyl trimethoxysilane, Amino group content Silang, such as N.N'-bis aminopropyl methyl dimethoxysilane, gamma-(2-aminoethyl) aminopropyl ethyl dimethoxysilane, dimethoxysilane, gamma-(2-aminoethyl) aminopropyl trimethoxysilane, gamma-(2-aminoethyl) dimethoxysitane, gamma-aminopropyl ethyl dimethoxysitane, gamma-aminopropyl ethoxy mentioned silane compound as a (H) ingredient.

he (H) ingredient used for this invention is used in 0.1-10 copies to 100 copies of organic polymers of the (A4) ingredient. It is preferred to use it in 1-5 copies especially. The above-mentioned (H)

in this invention, an epoxy resin can be used as a (I) Ingredient. This epoxy resin has a function which raises stability, endurance, and creep resistance further while improving impact strength and tough ngredient may be used only by one kind, and may carry out two or more kind mixing use.

nature of an organic polymer which are the (A4) ingredients of this invention.

tough nature, stability, endurance, and creep resistance becomes will be hard to be acquired if a rate of a /epoxy resin becomes less than 1/100 and a rate of (A4)/epoxy resin surpasses 100/1, intensity epoxy resins or novolak type epoxy resin is raised. Ranges of a using rate of these epoxy resin (D and of an organic polymer hardened material will become insufficient. Since a desirable using rate changes As an epoxy resin used as a (1) ingredient of this invention, an epichlorohydrin bisphenol A type epoxy spoxy resin, A glycidyl ether type epoxy resin of a bisphenol A propylene oxide addition, p-oxybenzolo diaminodiphenylmethane system epoxy resin, a urethane modified epoxy resin, Various cycloaliphaticimproving intensity of a hardened meteorial of the (A4) ingradient, it is good to carry out 5-50 weight-section use of the epoxy resin five to 100 weight section still more preferably sepacially one to 200 spoxy-resin and N,N-diglyoldyl aniline, N,N-diglycidyl o-toluidine, Aithough an epoxidation thing of an glycidyl other of tetrabromobisphenol A, Novolak type epoxy resin, a hydrogenation bisphenol A type weight ratio. (A4) If the improvement effect of impact strength of an epoxy resin hardened material. uneaturation polyman, etc. are illustrated et the time, such as glycidyl ether of polyhydrio alcohol, e currently generally used is used, and it gets. What contains an epoxy group in [two] a molecule at esin, Fire retardancy type epoxy resins, such as epichlorohydrin bisphenol F type epoxy resin and reactive silicon group containing organic polymer (A4) are (A4)/epoxy resin =100 / 1 - 1/100 in a east has high reactivity when hardening, and a herdened materiel is preferred from points -- it is easy to build three-dimensional meshes of a net. As a still more desirable thing, bisphenol A type preferably one to 100 weight section to epoxy resin 100 weight section. On the other hand, when improving the shock resistance of an epoxy resin hardened material, flexibility, tough nature, peol polyalkylene glycol diglycidyl ether, and glycerin, Not a thing limited to these but an epoxy resin with uses of a hardenability constituent, etc., are not generally decided, but. For example, when strength, etc., it is good to carry out 5-100 weight-section use of the (A4) ingredient still more rydantoin type epoxy resin, and petroleum resin, at the time, such as triglycidyl isocyanurate, cid glycidyl ether ester typed epoxy resin, m-aminophenol series epoxy resin, A weight section to (A4) ingredient 100 weight section. 0251]

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and gooding the reducing each winder mote as constituent of their invortion therein an approxy reads and as december of the seasof there is no overlation in protection in particular and over each selection currently gooding used not be used, there is no overlation in particular and provided and over each selection of the countries of the currently and control of the seasof selection of the countries of the currently developed reads and the currently and the currently protection. The first and control of the currently developed reads and countries of the currently developed reads and countries and union and ophydriate second closs an invest 24 christians the control of the currently there is redependent of the currently there is redependent of the currently there is the currently of these is the currently of these is the currently of currently of the currently of currently of the currently of th

Viscos). Then using a hardening agent of an epoxy resin, the amount used is the range of 0.1 to 300 weight section. Section to epoxy resin 100 weight section.

nardening agent may also be independent or two or more sorts may be used together.

deficience on be used as a lawdoning agent of an apoxy reals. In this state whore kettinine does not deficience on the control of the state whom is defined to the control of the control

Although what is necessary is just to use a publicy known anthe compound and a carbonyl Although what is necessary is just to use a publicy known anthe compound and a carbonyl discounted for camping by the definition of heimine, he as mante compound, for camping hydrendization. Therefore, and the settlement is demonstrated by the definition of the public of the demonstrated by the definition of the demonstrated by the definition of the demonstrated by the demons

When an innice group solits in kelenine and innice group make be made to restrict to the problet them: which exest, and an express collection to an innice group make be made to restrict to the problet them: may be used independently. You or more kinds may be used ally glocially effects the solid herbitmes may be used independently. You or more kinds may be used together and used for them, I—100 with glocial collection.

natonic acid methylethyl, and dibenzoylmethana, J. eto, can be used.

Various building agents other than a minute hollow body of the (F) impredent may be befored duffine a Various building agents other than a minute hollow body of the (F) impredent may be befored duffine a constraint and a said building agent, but for eventile, furnes saides, administration nature saides, therefore must make building agents, such as a simple agent and the proposal said any profit is of any profit to the constraint make building agents, and as mingrasam carbonate, distanciate, and any said and administration duffined building agents and a simple activity, before order as an one of the said of the constraints and a said of the constraints of the constraints of the constraints are not also as a selection, diese flows and flowers and such active articles and selection, diese flows and flowers and selection agents of fibrored files a sub-

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To obtain a handeaubility constituent with high retensity with the sub-filling energests. Bailed present described resident with curvar ailline, a silicio and amhydrede hydrous silicios andis, corbon flastek, A described reside will be obtained if a bulling agent chosen from surface treatment desalidad sabelum accidente. Bailed will be obtained if a bulling agent chosen from surface treatment desalidad sabelum configuration. All configurations within the surface treatment desalidad sabelum to organic opportunition. (10 to weight section. When adopted weath to organic a bulling in bedreading in many debeast from the surface. The configuration when the organic power first bulling section and the last least all the remps of 5 - 0 conveiled seadow to organic power (5). (10) weight section. Of course, these bulling spents may be used only by one field, and may min and use two or more

[0259] Inadeability constituent of this invention, since elongation of a hardened material can be eningred or a for of building agents can be mixed if a plasticizer is used, using it together with a bringing agent, it is more effective.

(10200)

Let this planticion; diocyl prihalito, diunyl pithalito, Phihalic estar, auch as buylbenzyl pithalito.

Doneyl deidigan, Alibarid featin and est treat and as secretic acid todocyl principal conflicts of the process. The process are considered to the process and as annually each of independent in the produced. There by possible to dietal. Alibarido confess are treat agreement and indicative and obtained and obtained in the process. The process and as annually each of indicative in the process and as annually each of indicative in the process. The process are treat and the process are considered in the process of pasters of deports of pasterior distance and other constrained an abundant participation. Polystrome, such as polystrome and pasterior and obtained and process are processed to an across region of the processed of the process of pasters of the processes and the participation and pulsarior and obtained the paster and pulsarior and obtained before the polystrome, polystrome, and other instances and other processes and polymer (A) to obtain the bediender of the amount of plasticisters is used in 100 or less weight sections to organic

Appropries passicione an the usual of a populmon passicione in seus, a compromed with a sone whom commonine application with the a planticione which the subsequence of the seus of Applicatione and the seus of t

and control passes positions to proper of the Uniqueductual registration and extension operations are preferred. Population or passes and a virily-hase polyment are secured. A next resistant point to compatibility was established and a virily-hase polyment are secured preferred. As in a virily-hase polyment are secured preferred as in a virily-hase polyment are secured preferred and survival properties and an analysis polyment and/or in mediatorisis option polyment are preferred and survival properties and any properties and pulp, voltage.

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JP.2006-316287,A [DETAILED DESCRIPTION]

vefcrably. It is 1000-3000 most praferably. If a molecular weight is too low, a plasticizer can flow out plasticizer is not limited, a narrow thing is preferred and less than 1.80 are preferred. 1.70 or less are Uthough number average molacular weights of a polymeric plasticizar are 500-15000 preferably, they ime, and alkyd paintwork cannot be improved. If a molecular waight is too high, viacosity will become are 800-10000 more preferably -- further -- desirable -- 1000-8000 -- it is 1000-5000 especially emporally by heat or a rainfall, early physical propertias cannot be maintained over a long period of ligh and workability will worsen. Although molecular weight distribution in particular of a polymeric nore preferred, in addition, 1,60 or less are preferred, 1,50 or less are still more preferred, 1,40 especially or less are preferred, and 1.30 or less are the most preferred.

A number average molecular weight of a polymeric plasticizer and molecular weight distribution Mw/Mn) are measured by the GPC method (polystyrene conversion). Although a polymeric plasticizer does not have a reactive silicon group, it may have a reactive silicon group. When it has a reactive sillion group, it acts as a reaction plasticizer and shift of a plasticizer group, the number averaga molecular weight needs to be lower than a polymer of the (A) ingredient. nolecule and one or less piece and 0.8 mora piece or less are preferred. When using a plasticizer which has a reactive silicon group, especially an oxyalkylene polymer which has a reactive silicon rom a hardened material can be prevented. When it has a reactive silicon group, it averages per

A plasticizer may be used alone and may use two or more sorts togethar. A low molecule plasticizer and a polymoric plasticizer can also be blended at the time of polymer manufacture.

section preferably five to 150 weight section to (A) ingredient 100 weight section. In less than five The amount of plasticizer used is 20 - 100 weight section still more preferably ten to 120 weight weight sections, if an effect as a plasticizer stops being revealed and 150 weight sections are xceeded, mechanical strength of a hardened material runs short.

t is a general formula in order to improve the activity of a condensation catalyst more in a

tydrocarbon group of the carbon numbers 1-20 independently among a formula, respectively.) a is 0, , 2, or 3. A silicon compound shown may be added. Although limitation is not carried out, as said ardenability constituent of this invention. R_aSKOR) 4-a (R is substitution or an unsubstituted silicon oompound Phenyltrimethoxysilane, Phenylmethyldimethoxysilane,

chenyldimethylmethoxyailane, Sinca the effect that what is an aryl group of the carbon numbers 6-20 diphenyldimethoxysilane, diphenyl diethoxyaliane, and urbhanylmethoxysilane, is preferred. Especially diphenyldimethoxysilane and diphenyl diethoxyaliane are low coat, and ospecially since they are easy more preferred. If loadings of a silicon compound are less than this range, an effect of accelerating a sections are preferred to (A) ingredient 100 weight section, and its 0.1 - 10 weight section is still hardening reaction may become small. On the other hand, when loadings of a silicon compound to receive, they are praferred. As for loadings of this silicon compound, about 0.01-20 weight ocelerates a hardoning reaction of a constituent is large, R in general formulas, auch as exoced this range, hardness and tensile strength of a hardened material may fall.

alkoxysilane, such as dimethyldimethoxysilane, trimethylmethoxysilane, and n-propyltrimethoxysilane. Dimethyldi iso propenoxysilane. Alkyl iso propenoxysilane, such as methyl TORIISO propenoxysilane A physical-properties regulator which adjusts the tractive characteristics of a hardened material generated if needed to a hardenability constituent of this invention may be added. Although not imited especially as a physical-properties regulator, for example Methyl trimetoxysilane, Alkyl

vinyldimethylmethoxysilane, gamma-aminopropyl trimethoxysilane, The alkoxysilane; silicone varnishes olysiloxanes are mentioned. By using said physical properties regulator, hardness when stiffening a which have functional groups, such as N-(bata-aminoethyl) aminopropyl methyl dimethoxysilane, gamma-meroaptpropylmethyl dimethoxysilane; methyldimethoxyailane, gamma-glycidoxypropyltrimetoxysilane, Vinyltrimetoxysilane, and gamma-glycidoxy propylmethyl JIISO propenoxysilane, gamma-glycidoxy propyl

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constituent of this invention is raised, or hardness is lowered conversely and elongation after fracture can be taken out. The above-mentioned physical-proparties regulator may be used independently, and may be usad togather two or mora sorts.

compound which is a derivetive of polyhydric alcohol whose numbers of hydroxyl groups, such as giverin, pentaerythritol, or sorbitol, are three or more, and generates R₃SIOH **, such as a trimethyl nydrolysis, Trimethylolpropane indicated to JP,H11-241029.A. A compound which generates a silicon sspecially a trimethyl silanol is preferred. A compound indicated to JP.H5-117521,A can be raised as a compound which generates a compound which has a univalent silanol group in intramolecular by ydrolysis. A compound which generates a silicon compound which is a derivative of alkyl alcohol, such as a hexanol, octanol, and decanol, and generates R₃SiOH **, such as a trimethyl silanol. by without worsening stickiness of the surface of a hardened material. A compound which generates intramolecular by hydrolysis has the oparation which reduces a modulus of a hardaned material Especially a compound that generates a compound which has a univalent silanol group in silanol, by hydrolysis can be raised.

monosilanol content compound by a hydrolytic silicon content group and hydrolysis in which bridge A compound which generates a silicon compound which is a derivative of an oxypropylene polymer ydrolysis can also be raised. A polymer which has a sillicon content group which can serve as a which is indicated to JP,H7-258534,A, and generates R₃SIOH(s), such as a trimethyl silanol, by construction furtharmora indicated to JP,H6-279693,A is possible can also be used.

A physical-properties regulator is preferably used in the range of 0.5-10 weight section 0.1 to 20weight section to (A) ingredient 100 weight section.

These thixotropic grant agent (lappet inhibitor) may be used independently, and may be used together two or more sorts. A thixotropic grant agent is used in the range of 0.1 – 20 weight section to (A) improve workability, a thixotropic grant agent (lappet inhibitor) may be added. Although not limited derivative; caloium stearate, aluminum stearate, and barium stearate, is mentioned, for example. in a hardenability constituent of this invention, a lappet is prevented if needed, and in order to especially as a lappet inhibitor, metallic soap, such as polyamide wax; hydrogenation castor oil ingredient 100 weight section.

spoxy octyl stearsts, opoxy butyl stearsts, etc. are raised. Especially in these, E-PS is preferred. An epoxy compound is good to use it in the range of 0.5-50 weight section to (A) ingredient 100 weight acid ester, alioyola fellows epoxy compounds, and an epichlorohydrin derivative as a compound which A compound which contains an epoxy group in one molecule in a constituent of this invention can be mproved. Compounds shown in epoxidation unsaturation oil and fat, epoxidation unsaturation fatty used. If a compound which has an apoxy group is used, tha stability of a hardaned material can be epoxidation linseed oil, a di(2-ethylhexyl) 4.5-epoxy cyclohaxane-1,2-JIKABOKISHI rate (E-PS), has an epoxy group, those mixtures, etc. can be illustrated. Specifically, epoxidized soyboan oil,

material, and an operation of preventing adhesion of stickiness of the surface. garbage on the surface of a hardened material, and dust is carried out. Drying oil represented with tung oil, linseed oil, etc. by example of an oxygen hardenability substance, Various alkyd resins produced by densturalizing this polybutatiens produced by making carry out copolymerization. Liquefied polymers, such as a polymer of 1.4-polybutatiene, 05 - 08 diene, NBR produced by making carry out copolymerization of these compound. An acrylic polymer which denaturalized with drying oil, Epoxy system resin, silicon resin. Butadiane, chloroprane, isoprene, Dians series, such as 1,3-pontadiene, a polymerization or 1,2liene series and the monomers which have copolymeric, such as sorylonitrile and styrene, so that An oxygen hardenability substance can be used for a constituent of this invention. To an oxygen hardenability substance, an unsaturated compound which can react to oxygen in the air can be illustrated, it reacts to oxygen in the air, a cured film is formed near the surface of a hardened

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chase, tung oil and a liquefied diene system polymer are preferred. Concomitant usa of a oatalyst end jiane aeries may serva as a subject, Liquefied copolymars, those various denaturation things, etc. (a veight section. If an improvement of stain resistance becomes less enough when said amount used ractive characteristics of a hardened material, etc. to be spoiled will arise. An oxygen hardenability batalysts and metal driers, metal salt, such as cobalt naphthenate, lead naphthenate, a naphthenic nallein-ized denaturation thing a boiled oil denaturation thing, etc.), such as SBR, are mentioned. hese may be used independently and may be used together two or more sorts. Especially among illustrated. It is at best still more preferred to use it in the range of 0.1 - 20 weight section to (A) ingredient 100 weight section, and the amount of oxygen hardenability substance used is 0.5 - 10 substance is good to use it, using together with a photoresist substance as indicated to JP,H3will be less than 0.1 weight sections, and 20 weight sections are surpassed, a tendency for the a matal drier which promote an oxidation hardening reaction may heighten an effect. As these acid zirconium, ootylic acid cobalt, and an octylic acid zirconium, an amine compound, etc. are

60053,A.

4 photorcsist substance can be used for a constituent of this invention. If a photoresist substance is used, a coat of a photoresist substance is formed in the hardened material surface, and stickiness of ubstance produces physical-properties change of hardening etc. Many things, such as a constituent parely. It is mixtures, such as oligomer or it, and monomers, such as propyions for chutylone, vell pixturent, and monomers and necessary districtional forests dimethorsystes or with a molecular vell for the forest of the pixturent of the pixtu ARONIKKUSU M-210 (2 Functional), ARONIKKUSU M-215, ARONIKKUSU M-220, ARONIKKUSU Mcontaining especially an acrylic functional group is preferred, and a compound which averages in one 233, ARONIKKUSU M-240, ARONIKKUSU M-305 of ARONIKKUSU M-245; (three organic functions), light, molecular structure causas a chemical change considerably for a short time, and a photorasist ARONIKKUSU M-309, ARONIKKUSU M-310, AIthough ARONIKKUSU M-315, ARONIKKUSU M-320, a hardened material and the weatherability of a hardened material can be improved. By operation of molecule and contains the three or more functional groups is preforred. (Each ARONIKKUSU is a containing an organic monomer, oligomer, reain, or them, are known by this kind of compound, and compound, acrylic or an methacrylic system unsaturation group 1 thru/or a monomer which it has ARONIKKUSU M-325, (polyfunctional) ARONIKKUSU M-400, etc. can be illustrated, a compound compound, polycinnamic acid vinyl, or azide-ized resin can be used. As an unsaturation acrylic commercial arbitrary things can be adopted as it. As a typical thing, an unsaturation acrylic product of Toagosel chemical industry incorporated company above.)

and amines, may heighten an effect. A photoresist substance is good to use it in the range of 0.5-10oinnamic soid is illustrated. Azide-ized resin is known as a photopolymar which uses an azido group as a sensitization group, usually, a "photopolymer" (Shows 47(1972) — on March 17) besides [which as a sensitization group, usually, a "photopolymer" (Shows 47(1972) — on March 17) besides [which illustration — these — a sensitizer can be used, being able to mix and adding [it can be independent, A polyoinnamic acid vinyl darivative of many besides what is a photopolymer which uses a cinnamoyl weight section preferably 0.1 to 20 weight section to (A) ingredient 100 weight section, and in 0.1 or less weight section, since there is no effect which improves weatherability, and a hardened material or] if needed. Addition of accelerators, such as sonsitizers, such as ketone and a nitro compound, becomes hard too much and produces a cracking grack in 20 or more weight sections, it is not added a diazido compound aa a aensitizing agent] a rubber sensitizing solution [and] printing group as a sensitization group as polycinnamic acid vinyl, and estarified polyvinyl alcohol with society publication part issue, and the 93rd page - 106th page - 117th page - have detailed Sesirable.

used, the weatherability of a hardened material can be improved. Although a hindered phonol system, An antioxidant (antiaging agent) can be used for a constituent of this invention. If an antioxidant is above);MARK LA-57, MARK LA-62, MARK LA-67, and MARK. LA-63 and MARK. LA-68. (All ore ADEKAAGASU chemicals incorporated company make abova); A hindered amino light stabiliser a mono- phenol system, a bisphenol system, and a polyphenol system can be illustrated as an antioxident, especially a hindered phenol system is preferred, Similarly, Tinuvin 622LD, thruvin 144 CHIMASSORB944LD, CHIMASSORB119floor-line(all are Ciba-Geigy Japan, Inc. make

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1114, and SANORU LS-744 (all are the Sankyo Co., Ltd. make abova) can also be used. An example shown in SANORU LS-770, SANORU LS-765, SANORU LS-292, SANORU LS-2826, SANORU LSpreferred to use it in the range of 0.1 - 10 weight section to (A) Ingredient 100 weight section, and of an antioxidant is indicated also to JP,H4-283259,A or JP,H9-194731,A. It is at beat still more the amount of antioxidant used is 0.2 - 5 weight section.

especially a hindered amine system is preferred. It is at best still more preferred to use it in the range of 0.1 - 10 weight section to (A) ingredient 100 weight section, and the amount of light stabilizer used photooxidation degradation of a hardened material can be prevented. Although a benzotriazol system, a hindered amine system, a benzoate system compound, etc. can be illustrated as light stabilizer, is 0.2 - 5 weight section. An example of light stabilizer is indicated also to JP,H9-194731,A. Light stabilizer oan ba used for a constituent of this invention. If light stabilizer ia used,

stability improvement of a constituent. As a tertiary amine content hindered amine light stabiliser. ** stabiliser as a hindered amine light stabiliser as indicated to JP,H5-70531,A because of preservation thurin 6221.0 and thronn 144; OHMASSORBI19Nor has All me to Ober-Celey Japan, hos make already MARKAT, Levig, Levig Levige me A DERACHONSU telembale incorporated comparated comparated by the Celegy of the Celegy Levige Levige Levige Levige Celegy (March of Service Oo. Levige Celegy). constituent of this invention, it is preferred to use a tertiary amine content hindered amine light When an unsaturation acrylle compound is used especially as a photoresist substance in a

make above) etc. — light stabilizer can ba illustrated.

weight section to (A) ingredient 100 weight section, and the amount of ultraviolet ray absorbent used is 0.2 - 5 weight section. It is preferred to use together and use a phonol system, a hindered phenolic benzophenone series, a benzotriazol system, a salicylate series, a substitution tolyl system, a metal benzotriazol system is preferred. It is at best still more preferred to use it in the range of 0.1 - 10 An utraviolat my absorbant can be used for a constituent of this invention. If an utraviolet rey absorbant is used, the surface weatherability of a hardened material can be improved. Although a antioxidant, a hindered amine light stabiliser, and a benzotriazel system ultraviolet ray absorbent. chelate system compound, etc. can be illustrated as an ultraviolet ray absorbent, especially a 0280

hardenability constituent of this invention, for example, was described above is blended, it kneads iquid [auch as 1 liquid type and a two-component type,] type compound can also be made and dissolved using a little suitable solvents, a usual method of mixing is adopted, and it gets. A many under ordinary temperature or heating using a mixer, a roll, a kneader, etc., or an ingredient is An ingredient which limitation in particular does not have in the method of preparation of a used by combining these ingredients suitably.

If a hardanability constituant of this invention is exposed into the atmosphare, by operation of moisture, it will form network structure in three dimansions, and will harden it promptly to a solid which has rubber-like elasticity. it faces using a hardenability constituent of this invention, If needed Adhesive improving agents other than an aminosilane, a physical-properties regulator, it is possible to add suitably various additive deactivator, anti-ozonant, light stabilizer, amine system radical chain inhibitor, the Lynn system gents, such as a preservation stability improving agent, an ultraviolet ray absorbent, a metal peroxide decomposition agent, lubricant, paints, and a foaming agent

naterial for masonry joints of sheathing materials, such as a medical aquipment aealant, food packing sealing sgent, pre-insulation an electric wire, material for cables, Elsatic adhesives, powder coatings, sasting material, a medical-application rubber material, a medical-application binder. A sealing insulation materials, such as electric electronic component materials, such as a solar cell rear-face A hardensbillty constituent of this invention can be used for sealant, such as a binder, a building, a narine vessel, and a super highway, adhesives, modeling material, a vibroisolating material, a sound deadener, a sound insulating material, a charge of foam, a paint, a gunning material, eto. Electrical

2010/04/30 http://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi-cjie?atw_u=http%3A%2F%2Fwww4.ipdl.i.. JP,2006-316287,A [DETAILED DESCRIPTION]

proof of the glass laminate end face (out sootion), autoparts, electrical machinery parts, several kinds of machina part, etc. Since, or help of a primer is borrowed and it may stick to substrates of a ***** arge area, such as glass, porcelain, wood, metal, and a resin-molding thing, it is usable also as various from excelling in stability, endurance, and creeping property. Adhesives for interior panels, adhesives electric electrons, a film, a gasket, İt ia available for various uses, auch as a fluid-sealant egent uaed inishing adhesives, adhesives for finishing of wall, adhesives for car panels, It is desirable, especially when it is considered as the electrical and electric coalement an electron and adhesives for providior mechanical requirents assertines, a sealing material for direct grazing, a sealing material for material for forcet grazing, a sealing material for material for second agraal generator construction methods, on a sealing material for working joint of the building and uses. naterial, and a sizing board, A costing material, a primer, a conductive material for electromagnetic wave cover, a thermally conductive material, A charge of a hot melt material, a potting agant for seal constituents and adhesion constituents of a type. A hardenability constituent of this invention for face panels, adhesives for tiling, adhesives for stone tensions. Ceiling finishing adhesives, floor in various molding materials and wired sheet glass and a sealing agent for rust prevention / water

Effect of the Invention

0285

The hardenability constituent of this invention is excellant in stability, endurance, and crace resintance.

[Bast Mode of Carrying Out the Invention]

Although working example is hung up over balow and this invention is explained to it in more datail, this invention is not limited only to these working example. 0286]

Synthetic example 1)

Jse polyoxypropylene triol of the molecular weight 3,000 [about] as an initiator, and propylene oxide earding system) polypropyline oxido was obtained. Their the methanol solution of NaOthe of the anginisative was added 1.2 times to the hydroxyling prout of this hydroxyl prous end bolyproxylens route and methanoly was defined off, and also the silv followide was ediced, and the though parrying out mixed stirring of the water 300 weight section and centrifugal apparation removed water nolecular weight about 26,000 (polystyrene reduced molecular weight in which the column measured the solvent using THF using the TOSOH TSK-GEL H type using TOSOH HLC-8120GPC as a liquidchloride. To allyl end polypropylene oxide 100 weight section which is not refined [which was obtained], in-hexano 300 weight section. After it carried out mixed stirring of the water 300 weight functions polypropylena oxide of the number average molecular waight 26,000 [about] which is an gain, decomprassion devolatilization removed hexane. By the above, the end obtained 3 organicend was changed into the allyl group. Decompression devolatilization removed the unreacted allyl is polymerized in a zinc hexa cyanocobaltate glyme complex compound catalyst, Number average section further at the hexane solution obtained by centrifugal separation removing water after allyl group.

sity group end polycoxysitydene series polymer (A-1) was obtained. Measurement by ¹H-NMR (it measures in a GDC)₃ solvent using JEOL JNM-LA400) everaged the methyl dimethoxy sibly group of react to methyl dimethoxysilane 1.4 weight section at 90 ** for 5 hours, and the methyl dimethoxy made into a catalyst to allyl end polypropylene oxide 100 obtained weight section, it was made to 50 ppm of platinum content 3vt% of platinum vinyl siloxane complexes isopropanol solutions are

the end per molecule, and they were 2.3 pieces.

uplexs, and light stabilizer (the Sankyo make,) SANORU LS7701 weight section and an ultraviolet ray colloid calcium carbonate (product mada from Shiraishi industry, Hakuenka OCR) 120 weight aection, Translum oxide (tehthars Sangoo make, TIPAQUE R-820) 20 weight section, DIDP55 weight section, the amount part of thixotropic grant agent (made in [Kusumoto Chamicals], DISUPARON 6500) the amount part of thixotropic grant agent (made in [Kusumoto Chamicals], DISUPARON 6500) synthetic example 1 according to the combination formula shown in Table 1. Surface treatment Organic polymer (A-1) 100 weight section which has the reactive silicon group obtained in the Working example 1-4 and comparative examples 1-2)

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the dibutykin bissocty/soctonate (trade name: U-220); Japanese east — transformation — make and the product made from neo decenoic scid tin (divalent) (trade name: U-50); Japan epoxy resin.) given the product made from neo decenoic scid tin (divalent) (trade name: U-50); Japan epoxy resin.) given (aminoctryl)-gamma-aminopropyl trimethoxysilane (the Nippon Unioar maka.) A-1120) silicate (made in a col coat.) given in three weight sections and Table 1 Made in an ethyl silicate 28; col coat, ethyl made from Quchi Shinko Chemical industry, NOKURAKKU SP) 1 weight aection, The amount part of dehydrator vinyltrimetoxysilane (Nippon Unicar make, A-171) duplaxa, adheslon grant agent N-betaailicate 40; Made in a col coat, a curing catalyst (the Japanese east --- transformation --- make and in the amount part of methylsilicate 51 duplexs, and Table 1 Neo decanoic acid (trade name: BASA carried out number-of-copies addition, after kneeding in the state where moisture does not exist substantially under drying conditions, it seeled in the dampproof container and I liquid mold-ouring tick 10), the description to Table 1 of the Wake Pure Chemical Industries make and lauryl amine absorbent (made in Tiba Specialty Chemicals.) Tinuvin 3271 waight section, antioxidant (product nature constituent was obtained.

mm thick was created (per day) It examined by having pieroid this sheet to the No.3 demishall tyoe, and shaving paled by a part X. 200-mm/in having speed, who was extended at the three of intensity (MRA) and Ethreture at the time of MSOSOS hauling modulus (MRA) and Tichracure, and (%) It was 23 **x3 +50 **x recuperated in the class product of Table 1 on the 4th, and the sheet about 3 (Hauling physical properties of a hardened material) was measured. A result is shown in Table 1.

0290

It was 23 **x,3 +50 **x recuperated in the class product of Table 1 on the 4th, and the sheet about 3 mm thick was created. [per day] This sheet was pierced to the No. 3 dumbbell type, and where 20 mm is pulled to 40 mm between the marked lines (100% extension), it fixed at 60 ** for 24 hours. The recovery was measured from the rate which opened this wide at 23 ** and the marked line restored I hour afterward. It means that the one where the recovery is larger is excellent in stability. A result

(Creep measurement using the piece of a dumbbell)

is shown in Table 1.

It was 23 **x,3 +50 **x recuperated in the class product of Table 1 on the 4th, and the sheet about 3 mm thick was created. [per day] This sheet was pierced to the No. 3 dumbbell type, and the marked line of 20 mm of intervals was described. The end of this piece of a dumbbell was fixed in 60 ** oven. and the piece of a dumbbell was hung. 0.4 time as much load as M50 value obtained by the above marked lines of 200 hours after immadiately after imposing load was massured. It means that the one where a displacement difference is smaller is excellent in oresp rasistance. A result is shown in Table lower end of the hung piece of a dumbbell. The displacement difference of tha distance between the mentioned tension physical-properties measurement of this hardened material was imposed on the

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480	382	389	442	400	797	(%)	93		
2,23	96.1	2,35	2,61	2,27	2,00	(RPA)	91		
0.43	ZÞ 0	0.50	84.0	97.0	0.53	(RPa)	0 9 M	硬化物物性	
2.2	30.2	7 1	1.2	9.1	12.1	(mm)	4-1		
08	52	98	88	1/8	79	(%)	率元獻		
S/ '0		97.0	97.0	97.0		くきとがんなら	U.S.L		
2.1		2.1	2.1	2.1		014%14-71	類く、おれた]	
3.4		3.4	3.4	3.4		09-0444	群、YX额(**Nt		
 ' '	2	<u> </u>			7	\$\$\$\$\n-220	"AX数存	聚鹼小郠	
-		7				191-41/414			
\vdash			7			074-46/AFI			
	_			7	7	176594-128	代款(B)	4-466	
3	3	3	3	3	3	0S11-A	陈寻 协 护 篆赘		
7	2	7	7	2	7	171-A	隋水湖		
⊢ ĭ	1 i	H-i	1	1	1	4844E41	陸北切 小麵		
1-i-	1	1	1	1	1	#3F, 23SJ	南 观观锦代菜		
1	t i t	\vdash		1	T	0/1-STM-/#	(株宝)		
7	7	7	2	2	7	1. 13V. U. #6500	14. 14. 14. 14. 14. 14. 14. 14. 14. 14.		
99	gg	99	99	99	99	9010	除以	<u>[a</u>	
20	50	20	50	50	50	44v48-850			
150	150	150	150	120	120	ROO華禮白	林真		
100	100	100	100	100	100	I − A	徐敖 (A)		
7	1	7	3	2	1				
解發和		1	[6]	新実		(結量重) 抗脉			

also with good silicate additive-free are shown, but. As shown in working exemple 2-4, stability and methylsilicate 51 which were used in working example 3-4 ere a condensate of a tetraethoxysilane carboxylic acid tin salt (neo SUTAN U-50), etc. as a curing catalyst, stability and creep resistance creep resistance further outstanding by silicate addition were shown. The ethyl silicate 40 and the catalyst, especially the recovery of creep resistance is low bad silicate additive-free. However, as As shown in the comparative example 1 of Table 1, when organic tin (U-220) is used as a curing shown in working exemple 1, stability and creep resistance are notably improved by addition of silicate. As shown in the comparative example 2, when organic tin (U-220) is used for ****, and a tetramethoxy silane, respectively, and showed the especially outstanding effect.

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JP,2006-316287,A [DETAILED DESCRIPTION]

(Synthetic example 2)

group end polypropylene oxide of the number average molecular weight 14,500 [about] produced by used, Allyl end polypropylene oxide was obtained in the same procedure as the synthetic exemple 1. o this allyl end polypropylene oxide, in the same procedure as the synthetic example 1, it was made lse polyoxypropylene glycol of the molecular weight 2,000 [ebout] as an initiator, and the hydroxyl polymerizing propylene oxide in the zinc hexa cyanocobaltate glyme complex compound cetalyst is to react to trimethoxysilane and the polyoxyalkylene series polymer (A-2) which has an average of 1.5 trimethoxysilyl groups at the end was obtained.

Synthetic example 3)

o the allyl end polypropylene oxide obtained in the synthetic example 2, in the same procedure as the synthetic example 1, it was made to react to triethoxysilane and the polyoxyalkylene series polymer (A-3) which has an average of 1.5 triethoxy sily! groups at the end was obtained.

To the alkyl and polypropylane oxide obtained in the synthetic example 2, in the same procedure as exprinted example 1, it was made to react to methyl dimethoxy aliane and the pobyovalitylene series polymer (4-4) which has an everage of 15 methyl dimethoxy silyl groups at the end was (Synthetic example 4)

Working example 5-11 and comparative examples 3-5)

Auplexs, and light stabilizer (the Sankyo make.) SANORU LS7701 weight section and an ultraviolet ray colleid calcium carbonate (product made from Shiraishi industry, Haluuenka COR) 120 welght section. Thanium oxide (Ishihara Sangyo make, TIPAQUE R-820) 20 weight section, DIDP12 weight section. absorbent (made in Tiba Specialty Chemicals.) Tinuvin 3271 weight section, antioxidant (product made from Ouchi Shinko Chemical industry, NOKURAKKU SP) 1 weight section. The amount part of (eminoethyl)-gamma-aminopropyl trimethoxysilane (the Nippon Unicer make.) A-1120) Three weight U-220); the Sankyo Organio Chemicals make, a dibutyitin JIRAURI rate (trade name: STANN BL)) of neme: U-50) and amine (the Wako Pure Chemical Industries make, lauryl emine) carried out numberdehydrator vinyltrimetoxysilane (Nippon Unicar make, A-171) duplexs, adhesion grant agent N-betacuring catalyst (Japanese east transformation make and dibutyltin bisacetylacetonate (trade name: synthetic examples 2-4 according to the combination formule shown in Table 2, Surface treatment the (D) ingredient given in Table 2, or the curing catalyst (the Japanese east -- transformation -drying conditions, it sealed in the dampproof container and 1 liquid mold-curing nature constituent sections, number of copies given [silicate (made in a col cost, methylsilicate 51)] in Table 2, the the amount part of thixotropic grant agent (made in [Kusumoto Chemicals]. DISUPARON 6500) of-copies addition, after kneading in the etate where moisture does not exist substantially under Organic polymer (A-2-4) 100 weight eection which has the reactive silicon group obtained in the make.) of the (O) ingredient The description to Table 2 of neo decensio soid tin (divalent) (trade was obtained.

It examined by having pulled by the same method as the above-mentioned using the class product of Table 2, and was extended at the time of intensity (MPa) and Eb:fracture at the time of M50:50% hauling modulus (MPe) and Tb:fracture, and (%) was measured. A result is shown in Table 2. The recovery was measured by the same method as the above-mentioned using the class product of recovery was measured from the rate which opened this wide at 23 ** and the marked line restored i hour afterward. A result is shown in Table 2. Table 2. However, the stratched state was fixed at 23 ** 100% for 24 hours this time, and the

[0300]

(Creep measurement using a shear sample)

The displacement difference with the 140-hour back immediately after creating the ** sample which is not carried an area of $20~\mathrm{mm} \times 25~\mathrm{mm}$ and 1 mm in thickness using the class product of Table 2, mposing 0.1MPe load for what recuperated [23 **x3 +50 **x] itself on the 4th in 60 ** oven, and mposing load was measured. [per day] The diaplacement difference made O x for the thing below nttp://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdil... 2010/04/30

0.4 mm, and the displacement difference carried out a thing of 0.4 mm or more. A result is shown in Table 2.

370	П
2,70	-
64 × 70 370 370	3
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2	L
- 1	L
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150	1
150	1
100	4
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· L	1
9	1,
9	

Table 2

Öre T	340	598	912	L91	807	208	181	961	163	(%)		93		
310	2.84	2.83	81.Z	2.20	2.08	5 35	2.61	2.20	5.24	(MPa)		dΤ	7	
2,70		10.1		1.15	0.92	26.0	1.13	96 '0	\$6.0	(BQM)			極化物物性	
0, 82	88.0	X	100	30.1	O	O	0	0	0				C-64	
×		/9	96	96	76	69	E6	63	63	(%)	率元數		Ø	
† 9	Lt	19	37.0	20	70					CELVIGE		VEY.		
_			37.0	-		_			-	09-U<#X##		(C) 成分		
			V 6		3	_		6.0	-	Stann BL				
3		2.0	-	7	-	2	5.0		2.0	14395U-220		代款(口)	预化绝媒	
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_			3	3	3	3	3	3	3	V-1120		済寻付抄兼祭		
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sibl groups from comparison with working comptle 5-0 of Table 2, and the comparative examples 9.5, stability and creaps enstance are improve motably. Morking example 10 which added silicate, and working scample 11 using controlled in a set force SUTAN U-70) as a curing catalyst showed the Then the reactive silicon group of an end usea the organic polymer (A-2-3) which is the Tori alkoxy

To the sliv) and polypropylene oxide obtained in the synthetic example 1, in the same procedure as the synthetic example 1, it was made to react to methyl dimethoxyellane and the polyoxyalkylene series polymer (A-5) which has an average of two methyl dimethoxy silyl groups at the end was (Synthetic example 5) obtained.

(Synthetic example 6)

used, Metallyl end polypropylene oxide was obtained in the sams procedure as the synthetic example under the atmosphere of the nitrogen to contain, it was made to react to methyl dimethoxysilane 3.2 group end polypropylene oxide of the number average molecular weight 26.000 [about] produced by polymerizing propylene oxide in the zinc hexa cyanocobaltate glyme complex compound catalyst is Use polyoxypropylene triol of the molecular weight 3,000 [about] as an initiator, and the hydroxyl platinum vinyl siloxane complexes isopropanol solution is made into a catalyst to this metallyl end polypropylene oxida 100 weight saction, oxygen -- 6vol% -- mixed suifur at a rate of 1 eq/Pt1eq except making an allyl chloride into chloridation metallyl. 0.5 copy of platinum content 3wt% of weight section at 90 ** for 5 hours, and the polyoxyalkylene series polymer (A-6) which has an

average of 2.8 methyl dimethoxy silyl groups at the end was obtained.

Working example 12-14 and comparative example 6) Organic polymer (A-1, A-4-6) 100 weight section which has the reactive silicon group obtained in the synthetic example 1 and the synthetic examples 4-6 according to the combination formula shown in Hakuenka CCR) 120 weight section, Titanium oxide (Ishihara Sangyo make, TIPAQUE R-820) 20 Table 3, Surface treatment colloid calcium carbonate (product made from Shiraishi industry,

BASA tick 10)) 1.2 weight section and amine (Wako Pure Chemical Industries make, lauryl amine) 0.75 Kusumoto Chemicals J. DISUPARON 6500) duplexs, and light stabilizer (the Sankyo make.) SANORU SP) I weight section, As the amount part of dehydrator vinyltrimetoxysilane (Nippon Unicar make, A-S7701 weight section and an ultraviolet ray absorbent (made in Tiba Specialty Chemicals.) Tinuvin 3271 weight section, antioxidant (product made from Ouchi Shinko Chemical Industry, NOKURAKKU Japanese east transformation make, neo decanoic acid tin (divalent) (trade name: U-50)) 3.4 weight section, Carboxylio acid (product made from Japan epoxy rasin, neo decanoic acid (trade name: 171) duplexa, adhesion grant agent N-beta-(aminoethyl)-gamma-aminopropyl trimethoxysilane (Nippon Unicar make, A-1120) 3 weight saction, and a curing catalyst, Carboxylic acid tin salt weight section, DIDP55 weight section, the amount part of thixotropic grant agent (made in

weight section are added, After kneading in the state where moisture does not exist substantially under drying conditions, it sealed in the dampproof container and 1 liquid mold-curing nature constituent was obtained.

It examined by having pulled by the same method as the above-mentioned using the class product of Table 3, and was extended at the time of intensity (MPa) and ELifacture at the time of M9050% haufing modulus (MPa) and Thirtecture, and (8) was measured. A result is shown in Table 3. [5008]

The ricovery was measured by the same method as the above-mentioned using the class product of Than 3. However, the structured state was freed at 60 ** 100% for 24 hours this time, and the recovery was measured from the tras which opened this wide at 23 ** and the marked line restored 1 hour alterwant A result is altown in Table 3.

he displacement difference of the distance between the marked lines of 200 hours after immediately

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mathod as the mathod of working example 1-4, using the class product of Table 3, was measured. A after performing orean massurament using the place of a dumbbell, and imposing load by the sama

result is shown in Table 3.
[0310]

ſ	205	273	483	109	(%)		EP		
Ì	2.02	1.87	2,30	2, 39	(RPa)		ďΤ		
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organic polymer with many reactive silicon groups per molecule (A-1, A-5-6) is excallent in stability Comparison with working example 12-14 of Table 3 and the comparative example 6 shows that the and creep resistance.

Jse polyoxypropylene glycol of the molecular weight 2,000 [about] as an initiator, and the hydroxyl (Synthetio example 7)

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group and polypropylene oxids of the number average molecular weight 28,500 [about] produced by used, Metallyl end polypropylane oxids was obtained in the same procedure as the synthetic example To this metallyl and polypropylene oxide, in the same procedure as the synthetic example 6, it was made to react to methyl dimethoxysilane and the polyoxyalkylene series polymer (A-7) which has an polymerizing propylene oxide in the zinc hexa cyanocobaltate glyma complex compound oatalyst is

(Synthetic example 8)

average of 1.9 methyl dimethoxy silyl groups at the end was obtained.

To the metallyl and polypropylene oxide obtained in the synthetic example 7, in the same procedure as the synthetic example 6, it was made to react to methyl directhoxysilane and the polyoxyalkylene series polymer (A-8) which has an average of 1.5 methyl dimethoxy silyl groups at the end was

group end polypropylene oxide of the number average molecular weight 28,500 [about] produced by Use polyoxypropylene glycol of the molecular weight 2,000 [about] as an initiator, and the hydroxyl Synthetic example 9)

used, Allyl and polypropylane oxide was obtained in the same procedure as the synthetic example 1. To this allyl and polypropylena oxida, in the same procedura as the synthetic example 1, it was made polymerizing propylene oxide in the zinc hexa cyanocobaltate glyme complex compound catalyst is to react to methyl dimethoxysilene and the polyoxyalkylene series polymer (A-9) which has an average of 1.5 methyl dimethoxy allyl groups at the end was obtained. (Working example 15-16 and comparative examples 7-8)

Organic polymer (A-4, A-7-9) 100 weight section which has the reactive silicon group obtained in the synthetic example 4 and the synthetic examples 7-9 according to the combination formula shown in

Kusumoto Chemicals J. DISUPARON 6500) duplexs, and light stabilizer (the Sankyo make.) SANORU dibutyltin bissoaty/acetonate (Japanese east transformation make, nco SUTAN U-220) duplexs wara 3271 weight section, antioxidant (product made from Ouchi Shinko Chemical industry, NOKURAKKU LS7701 weight section and an ultraviolet ray absorbent (made in Tiba Specialty Chemicals.) Tinuvin SP) 1 weight section, The amount part of dehydrator vinyltrimetoxysilane (Nippon Unicar make, A-171) duplexs, adhesion grant agent N-beta-(aminoethyl)-gamma-aminopropyl trimethoxysilane (the Table 4, Surface treatment colloid calcium carbonate (product made from Shiraishi industry, Hakucaka CGR) 120 weight section, Titanium oxide (Ishihara Sangyo make, TIPAQUE R-820) 20 conditions, it sealed in the dampproof container and 1 liquid mold-curing nature constituent was Nippon Unicar make.) A-1120) Three weight sections and the amount part of curing catalyst weight section, DIDP55 weight section, the amount part of thixotropic grant agent (made in added, after kneeding in the state where moisture does not exist substantially under drying

It examined by having pulled by the same method as the above-mentioned using the class product of Table 4, and was extended at the time of intensity (MPa) and Exfracture at the time of M5050% haufing modulus (MPa) and Tb-fracture, and (%) was measured. A result is shown in Table 4. The recovery was measured by the same method as the above-mentioned using the class product of recovery was measured from the rate which opened this wide at 23 ** and the marked line restored Table 4. However, the stretched state was fixed at 23 ** 100% for 24 hours this time, and the 24 hours afterward. A result is shown in Table 4.

The displacement difference of the distance between the marked lines of 45 hours after immediately

after performing creep measurement using the piece of a dumbbell, and imposing load by the same method as the method of working example 1-4, using the class product of Table 4, was measured. A result is shown in Table 4. 2010/04/30 http://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdl...

阳棘出

Comparison with working example 15–16 of Table 4 and the comparative examples 7–8 shows that the organic polymer (A-7-8) which introduced the reactive silicon group to the metallyl group end [0320]

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organicity polymer is excellent in stability and creep resistance

To the allyl and polypropylene oxide obtained in the synthetic example 1, in the same procedure as (Synthetic example 10)

made from Ouchi Shinko Chemical industry, NOKURAKKU SP) 1 weight section. As a dehydrator, the Organic polymer (A-1, A-10) 100 weight section which has the reactive silicon group obtained in the able 5. Surface treatment colloid calcium carbonate (product made from Solvay, Winnofil SPM) 120 Japanese east transformation make, neo SUTAN U-220) duplexa, After kneading in the state where weight section, Titanium oxide (product made from Kerr-McGee, RFK-2) 20 weight section, DIUP50 triethoxysilane (the Nippon Unicar make.) which is the (Q) ingredient as an adhesion grant agent Asynthetic example 1 and the synthetic example 10 according to the combination formula shown in weight section, Thixotropic grant agent (product made from Cray Valley, Crayvallacsuper) 5 weight 100) Or add N-beta-(aminoethyl)-gamma-aminopropyl trimethoxysilane (Nippon Unicar make, Amoisture does not exist substantially under drying conditions, it sealed in the dampproof container absorbent (made in Tiba Specialty Chemicals.) Tinuvin 3271 weight section, antioxidant (product the synthetic example 1, it was made to react to tristhoxysilane and the polyoxyalkylene series smount part of vinyltrimetoxysilane (Nippon Unicar make, A-171) duplexs, gamma-aminopropyl section, light stabilizer (Sankyo make, SANORULS770) 1 weight section and an ultraviolet ray 120) 3 weight section and the amount part of ouring ostalyst dibutyitin bisacetylacetonate olymer (A-10) which has an average of 2.3 triethoxy silyl groups at the end was obtained. and 1 liquid mold-curing nature constituent was obtained Working example 17 and comparative examples 9-10) 0322

The recovery was measured by the same method as the above-mentioned using the class product of recovery was measured from the rate which opened this wide at 23 ** and the marked line restored Table 5. However, the stretched state was fixed at 60 *** 100% for 24 hours this time, and the I hour afterward. A result is shown in Table 5. [0323] 0324

The displacement difference of the distance between the marked lines of 140 hours after immediately after parforming creep measurement using a shear sample and imposing load by the same method as the method of working example 5-11, using the class product of Table 5, was measured. As for the displacement difference carried out a thing of 0.4 mm or more. A result is shown in Table 5. valuation basis, the displacement difference made O x for the thing below 0.4 mm, and the

covered time) until the surface stretches a hide under 23 ** and 50% of humidity RH conditions was messured. The one where leather-covered time is shorter means that hardensbility is excellent. A The class product of Table 5 was thinly lengthened in thickness of about 3 mm, and time (leather-Hardenability of a hardenability constituent) result is shown in Table 5.

Table 5

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comparative example 12, after promoting the ester exchange reaction between reactive silicon groups yy recuperating oncself for seven days at 50 ** in these 1 liquid mold-curing nature constituents, the transformation make, neo SUTAN U-220) duplexs were sealed in the glassware which carried out the nitrogen purge, and 1 liquid mold-curing nature constituent was obtained. In the comparative example 11, the leather-covered time test was performed under 50% of 23 ** humidity RH conditions, without recuperating oneself in this 1 liquid mold-curing nature constituent. In working example 18 and the section and a dehydrator --- triethoxysilane (made in a col coat.) the N-bota-(aminoethyl)-gamms sminopropyl trimethoxysilana (tha Nippon Unicar make.) which is tha (H) ingredient as the amount eather-covered time test was performed under 50% of 23 ** humidity RH conditions. A result is gamma-aminopropyl triethoxysllane (the Shin-Etsu Chemical make.) It added, KBE-6033 weight aynthetic example 2 according to the combination formula shown in Table 6, as DIDP30 weight bart of ethyl silicate 28 duplexs, and an adhesion grant agent A-1120) or N-beta-(aminoethyl)section and the amount part of curing catalyst dibutyitin bisacetylacetonate (Japanese east shown in Table 6.

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reep resistance, ohange of the skinning time in storage order is small, and storage stability is good

If the aminosilane which has a triethoxy silyl group which is the (G) ingredient as an adhesive grant agent is combined with the and of the (A4) ingredient using the polymer which has a triethoxy silvi group as an organic polymer as shown in working example 17 of Table 5, Excelling in stability and

(uim) 71 **主義の日 L× 2。09** 阜 **当** 单 44757U-220 7 7 基机代约村工时 KBE-603 基机仪(計1)(川 A-1120 3 3 ž 8Z1-46:41±I 7 30 dala 30 30 基小小小村工厂 00 00 2 A (1 001 例 献 実 8 l 7.1 11 素トイ計の図 须朗 比較知

間胡張安 製鹼小動 育塑削 隋水朔 **本合重辦**

As shown in working example 18 of Table 6, the polymer which has a tricthoxy silyl group is used for he end of the (A4) ingredient as an organio polymer. If the aminosilene which has a methoxy sily! ttp://www4.ipdl.inpit.go.jp/cgi~bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdl.i.. 2010/04/30

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reaction is promoted by care of health, the hardenability of an orgenic polymer can be raised notably. group which is the (H) ingredient as an adhesive grant agent is combined and an ester exchange

Working example 19-20 and comparative example 13)

ndustry, Hakuenka CCR) 120 weight section, Titenium oxide (Ishihara Sangyo make, TIPAQUE R-820) Kusumoto Chemicals J. DISUPARON 6500) duplexs, and light stabilizer (the Sankyo meke.) SANORU satalyst of the (E) ingredient as a curing catalyst what carried out concomitant use addition of BASA oisacetylacetonate (Japanese east transformation make, neo SUTAN U-220) duplexs was made into 3271 weight section, antioxidant (product made from Ouchi Shinko Chemical industry, NOKURAKKU was obtained, the neo decanoic soid (the product made from Japan epoxy resin.) which is a non-tin LS7701 weight section and an ultraviolet ray absorbent (made in Tiba Specialty Chemicals.) Tinuvin 71) duplexs, adhesion grant agent N-beta-(aminocthyl)-gamma-aminopropyl trimethoxysilane (the catalysts were added, ofter kneading in the state where moisture does not exist substantially under SP) 1 weight section, The amount part of dehydrator vinyltrimetoxysilane (Nippon Unioar make, Adrying conditions, it sealed in the dempproof container and 1 liquid mold-curing nature constituent Metsumoto Trading make.) What carried out Olga Chicks TO-750 8.5 weight-scotion addition was synthetic example 10, Surface treatment colloid calcium cerbonate (product mede from Shiraishi tick 106 weight section and the amine (Wako Purc Chemical Industries make, lauryl amine) 0.75 Organic polymer (A-10) 100 weight section which has the reactive ailicon group obtained in the 20 weight section, DIDP55 weight section, the amount part of thixotropic grant agent (mede in Nippon Unicar make.) A-1120) Three weight sections and the various below-mentioned ouring weight section --- working example 19 and isopropoxy titanium bis (ethylacetoacetate) (the

As a result of measuring the recovery by the same method as the above-mentioned using these made into working example 20. What carried out the amount pert addition of dibutyltin the comparative example 13. 0332

class products, the hardened materiel of working example 19 and working example 20 showed the recovery higher than the hardened meterial of the comparative example 13.

Synthetic example 11)

0333

to react to triethoxysilane and the polyoxyalkylene series polymer (A-11) which has an average of 1.5 group end polypropylene oxide of the number average molecular weight 25,500 [about] produced by o this allyl end polypropylene oxide, in the same procedure as the synthetic example 1, it was made Use polyoxypropylene glycol of the molecular weight 2,000 [about] as an initiator, and the hydroxyl used, Allyl end polypropylene oxide was obtained in the same procedure as the synthetic example 1. polymerizing propylene oxide in the zinc hexe cyanocobaltate glyme complex compound catalyst is triethoxy silyl groups at the end was obtained. 0334]

To the allyl end polypropylane oxide obtained in the synthetic example 11, in the seme procedure as the synthetic example 1, it was made to react to methyl dimethoxysilane and the polyoxyalkylene series polymer (A-12) which has an average of 1.5 methyl dimethoxy silyl groups at the end was (Synthetic example 12) obtained.

(Working example 21 and comparative examples 14-15)

section, thixotropic grant agent (made in [Kusumoto Chemicals], DISUPARON 305) 3 weight section. calcium-carbonate (product made from Shiroishi celcium, HOWAITON SB) 20 weight section, DOP40 and a photo-eetting resin (the Toegosel make.) ARONIKKUSU M-3093 weight section, light stabilizer Organic polymer (A-11, A-12) 95 weight section which has the reactive silicon group obtained in the celolum carbonate (product made from Shiraishi industry, BISUKO light R) 60 weight section, Heavyweight section, epoxy system plasticizer (New Japan Chemical make, SANSO sizer EP-S) 20 weight Sankyo make, SANORULS770) 1 weight section, Ultraviolet ray absorbent (made in [Tiba Specialty Chemicals], tinuvin 327) 1 weight section, Zero copy of minute hollow body (the product made from product made from Shiraishi industry, Hakuenke OCR) 60 weight section, Surface treatment colloid synthetic example 11 and the synthetic example 12, Surface treatment colloid calclum carbonate

Jaing the mixture of 2-ethylhexanoic acid tin (Japanese east transformation make, U-28) (divalent) 3 using (A-12) as an organic polymer, and what added 20 copies of minute hollow bodies was made into olymer. What added zero copy of minute hollow body was made into the comparative example 14, the comparative example 15, using (A-11) as an organic polymer.

weight section and amine (Wako Pure Chemical Industries make, lauryl amine) 0.75 weight section as a hardening agent, above-mentioned base resin and hardening agent were mixed uniformly, and workability (******) and endurance were evaluated.

The constituent of working example 21 had workability better than the comparative example 14, and ts endurance was better than the comparative example 15.

(Norking example 22 and comparative example 16)

carbonate (product made from Shiraishi industry, BISUKO light R) 80 weight scotion, Heavy-calcium-carbonate (product made from Shiroishi calcium, HOWAITON SB) 20 weight section, DOP40 weight section, epoxy system plasticizer (New Japan Chemical make, SANSO sizer EP-S) 20 weight section. thixotropic grant agent (made in [Kusumoto Chemicals], DISUPARON 305) 3 weight section, and a photo-setting resin (the Toagosol make.) ARONIKKUSU M-3093 weight section, light etabilizer (Sankyo make, SANORULS770) 1 weight section, Ultraviolet ray absorbent (made in [Tha Specialty RUGA NOx 1010) 1 weight section were measured, respectively, and it often kneaded with a 3 paint example 10, or the synthetic example 1, Surface treatment colloid calcium carbonate (product made nade into working example 22, and what added 95 copies of (A-1) as an organic polymer was made roll, and was considered as base resin. What added 70 copies of (A-10) as an organic polymer was ethylhexanoic acid th (Japanese east transformation make, IJ-28) (divalent) 3 weight section and amine (Wako Pure Chemical Industries make, lauryl amine) 0,75 weight section was addod, and the Organic polymer (A-1) 95 weight section which has the reactive silicon group obtained in organic bolymer (A-10) 70 weight section which has the reactive allicon group obtained in the synthetic Chemicals], tinuvin 327) 1 weight section and antioxidant (made in [Tiba Specialty Chemicals]. from Shiraishi industry, Hakuenka CCR) 60 weight section, Surface treatment colloid calcium nto the comparative example 16. As a hardening agent, to this base resin, the mixture of 2-

The constituent of working example 22 showed the recovery higher than the comparative example 16, stopping weight % of an organic polymer low. recovery was measured to it.

was considered as base rasin. What added five copies of epoxy resins was made into working example NOx 1010) 1 weight section and zero copy of cpoxy resin (the product made from Japan epoxy resin, Epicoat 828), or five copies were measured, respectively, and it often kneaded with a 3 paint roll, and 23. What added zero copy of epoxy reain was made into the comparative example 17. As a hardening agent, to this base resin, the mixture of 2-ethythexanoic soid tin (Japanase east transformation Chemicals], tinuvin 327) 1 weight section, Antioxidant (made in [Tiba Specialty Chemicals], IRUGA made from Shiraishi industry, BISUKO light R) 60 weight section, Heavy-caloium-carbonate (product industry, Hakuonka CCR) 60 weight section, Surface treatment colloid calcium carbonate (product made from Shiroishi calcium, HOWAITON SB) 20 weight section. DoF40 weight section, secony system plasticizers (New Japan Opermical make, SAMSO atear EF-S) 20 weight section, trisorrong gamta agent fande in [Kausumoto Chemicals I, DISIPARON 365) 3 weight section, and a photosetting resin (the Toagosei make.) ARONIKKUSU M-3093 weight section, light stabilizer (Sankyo synthetic example 10. Surface treatment colloid calcium carbonate (product made from Shiraishi Organic polymer (A-10) 95 weight section which has the reactive silicon group obtained in the make, SANORULS770) 1 weight section, Ultraviolet ray absorbent (made in [Tiba Specialty (Working example 23 and comparative example 17)

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make, U-28) (divalent) 3 weight section and amine (Wako Pure Chemical Industries make, lauryl amine) 0.75 weight section was added, and the recovery was measured to it.

The constituent of working example 23 showed the recovery higher than the comparative example 17.

made from Shiraishi industry, BISUKO light R) 60 weight section, Heavy-calclum-carbonate (product made from Shiroishi calclum, HOWAITON SB) 20 weight section, DOP40 weight section, epoxy RUGA NOx 1010) 1 weight section were measured, respectively, and it often knesded with a 3 paint industry, Hakuenka OCR) 60 weight section, Surface treatment colloid calcium carbonate (product system plasticizer (New Japan Chemical make, SANSO sizer EP-S) 20 weight section, thixotropic grant agent (made in [Kusumoto Chemicals], DISUPARON 305) 3 weight section, and a photosetting resin (the Toagosci make.) ARONIKKUSU M-3093 weight section. light stabilizer (Sankyo Chemicals J. tinuvin 327) 1 weight section and antioxidant (made in [Tiba Specialty Chemicals]. synthetic example 10. Surface treatment colloid calcium carbonate (product made from Shiraishi Organic polymer (A-10) 95 weight section which has the reactive silicon group obtained in the make, SANORULS770) 1 weight section, Ultraviolet ray absorbent (made in [Tiba Specialty Working example 24 and comparative example 18)

(divalent) 3 weight section and amine (Wako Pure Chemical Industries make, lauryl amine) 0.75 weight section as a hardening agent was made into the comparative example 18. Base resin and a hardening 2-ethylhexanoic acid tin (Japanese east transformation make, U-28) (divalent) 3 weight section and oissoctylactionate (the Japanese cast — transformation -- make.) The thing using the mixture of neo SUTAN U-220 0.1 weight section as a hardening agent is made into working example 24. The amine (the Wako Pure Chemical Industrias make.) lauryl amine 0.75 weight section and dibutyltin thing using the mixture of 2-ethylhexanoio acid tin (Japanese east transformation make, U-28) agent were mixed uniformly and the recovery and thin layer hardenability were evaluated. oil, and was considered as base resin.

The constituent of working example 24 showed good thin layer hardenability rather than the comparative example 18, while the high recovery was shown.

(Synthetic example 13)

To the allyl end polyisobutylene obtained according to the example of manufacture of JP,H11-209639.A, under existence of Pt catalyst, it was made to react to triethoxysilane and the polysobutylene (A-13) which has a triethory ally group at the end was obtained. [Go46]

(Synthetic example 14)

To the allyl and polyisobutylane obtained in the synthatic example 13, under existence of Pt catalyst, it was made to react to methyl dimethoxysilane and the polyisobutylene (A-14) which has a methyl dimethoxy sliyl group at the end was obtained.

To organic polymer (A-13, A-14) 100 weight section which has the reactive silicon group obtained in (Working example 25 and comparative example 19)

the synthetic example 13 and the synthetic example 14, the amount part of dibuty/tin bisacety/acotonate (Japanesc cast transformation make, neo SUTAN U-220) duplexs was added, and hardened material of working example 25 showed the recovery higher than the comparative example the hardened material was obtained. The thing using (A-13) as an organic polymer was made into working example 25, and the thing using (A-14) was made into the comparative example 19. The

(Synthetic example 15)

siethyl adipate (8.8g), and acetonitrile (18.6g) were added to this, and stirring mixing was improved. for 15 minutes at 65 ** under a nitrogen atmosphere. Acrylic acid n-butyl (100g), 2, 5-dibromo

CuBr (4.2g) and acctonitrila (27.3g) were added to the reaction vessal with an agitator, and it stirred

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Pentamethyl diethylenetriamine (0.17g) was addad and the polymerization was made to start. Acrylio acid rr-butyl (400g) was dropped continuously, heating and stirring at 70 **. Dividing addition of the triamine (0.68g) was carried out in the middle of dropping of acrylic acid n-butyl.

10 ** succeedingly, and the mixture containing the polymer which has an alkenyl group was obtained. ** 1,7-octadien (53.7g), aostonitrile (132g), and triamine (1.69g) were added, it heated and stirred at When monomer conversion reachsa to 96%, after devolatilizing a ** monomer and acetonitrile at 80

added to the methyloyolohexane solution of the polymer to 100 copies of polymers, and it heated and leating devolatilization of acetonitrile in a mixture and the unreacted 1,7-octadien was carried out. copies of KYO word 700SL [:] product [Both] made from Harmony Chemicals) of adsorbent was polymer (polymer [P1]) which has an alkeryl group by condensing a polymer solution was obtained stirred under oxygen and nitrogen mixed gas atmosphere. Insoluble matter was removed and the sediment with a centrifuge, and was removed. Six copies (three copies of KYO word 500SH / 3 and it diluted with the methylcyclohoxane. The insoluble polymerization catalyst was made to

100 copies of the polymer with 400 copies of mathylcyclohexanes further and removing solid content, After having carried out heating devolatilization (10 or less torr of decompression degrees), diluting polymer [P2] was obtained. The number average molecular weight of this polymer [P2] was 24800, and molecular weight distribution was 1.36. The number of the alkenyl groups introduced per one staring the obtained polymer [Pt] at 180 ** for 12 hours, the solution was condensed and the molecule of polymers was 1.8.

were added in order, and it mixed, and heated and stirred at 100 ** under a nitrogen atmosphere for ethynyl)-1, 1 and 3, and 3-tetramethyl disiloxane (they are 1.5 mol equivalents to an alkenyl group) trimethoxysilyl group content polymer (A-15) which condenses a reaction mixture and is made into the purpose was obtained. The number average molecular weight was 27900 and molecular weight distribution was 1.32. The number of the silyl groups introduced per one molecule of polymers was To this polymer [P2], methyl orthoformate (it is 1 mol equivalent to an alkenyl group), A platinum 0.5 hour. It checked by ¹H-NMR that the alkenyl group had disappeared by a reaction, and the catalyst (it is 10 mg to 1 kg of polymers as an amount of platinum metal), 1-(2-trimethoxysilyl

Synthetio example 16)

ethynyl-1 used in the synthatic example 15,1 and 3, and 3-tatramethyl dislioxane. The number average molecular weight was 28600 and molecular weight distribution was 1.48. The number of the As opposed to the polymer [P2] obtained in the synthetic example 15, The triethoxy silyl group ricthoxysilane (they are 3 mol equivalents to an alkenyl group) instaad of 1-(2-trimethoxyailyl content polymer (A-16) was obtained like the synthetic example 15 except having used silvi groups introduced per one molecule of polymers was 1.5. [0354] (Synthetic example 17)

As opposed to the polymer [P2] obtained in the synthetic example 15, it is methyl dinethoxysilane (to an alkenyl group.) instead of 1-(2-trimethoxysilyl ethynyl)-1 used in the synthetic example 15, 1 average molecular weight was 28400 and molecular weight distribution was 1.51. The number of the and 3, and 3-tetramethyl disiloxane. The methyl dimethoxy silyl group content polymer (A-17) was obtained like the synthetic example 15 except having used three mol equivalents. The number silyl groups introduced per one molecule of polymers was 1.5.

(Working example 26-28 and comparative example 20)

20 weight agetion, titanium oxide (Jahiharra Sangyo make, TIPAQUE R-820) 10 weight section, DIDP60 weight acction, the amount part of thixotropic grant agent (made in [Kusumoto Chemicals]. GCR150 weight section and heavy oalcium carbonate (the Maruo Calcium make.) 25ANANOKKUSU as opposed to organic polymer 100 weight section which has a reactive silicon group - surface treatment colloid calcium carbonate (the product made from the Shiraishi industry.) Hakuenka

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JP.2006-316287,A [DETAILED DESCRIPTION]

kreading in the state where moisture does not exist substantially under drying conditions. It sealed in the dampproof container and I liquid mold-curing nature constituent was obtained. The **** thing for which has the trimethoxysilyl group obtained in the synthetic example 15 as an organic polymer which has a reactive silicon group, (A-15) Make the **** thing for a total of 100 weight sections into thing for 100 weight sections was made into the comparative example 20 for the acrylic ester system polymer (A-17) which has the metry, dimethoxy silyl group obtained in the synthetic oxample 17. The hardened material of working example 26-28 showed tha rocovery higher than the comparative The **** thing for 100 weight sections is made into working example 28 for the acrylic ester system adhesion grant agent N-beta-(aminoethy))-gamma-aminopropyl trimathoxysilane (the Nippon Unicar working example 27 for the mixture of 50 weight sections and polyoxyalkylene series polymer (A-4) DISUPARON 6500) duplexs, light stabilizar (Sankyo make, SANORUL.S765) 1 weight section and an polymer (A-16) which has the triethoxy silyl group obtained in the synthetic example 16, The **** dehydrator vinyltrimetoxysllane (the Nippon Unicar make.) A-171) the amount part of duplexs, and make.) A-1120) Dibutyitin bisacetylacetonate (Japanese east transformation make, neo SUTAN U-50 weight section which has the methyl dimethoxy silyl group obtained in the synthetic example 4, 100 weight sections is made into working example 26 for the acrylic ester system polymer (A-15) ultraviolet ray absorbent (made in Tiba Specialty Chemicals.) tinuvin 2131 weight section and 220) 0.2 weight asotion was added as the amount part of duplexs, and a curing oatalyst, after

The hardenability constituent of this invention is excallent in stability, endurance, and creep

Industrial applicability]

Translation done.]

resistance.

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NOTICES *

lamages caused by the use of this translation. PO and IMPIT are not responsible for any

This document has been translated by computer. So the translation may not reflect the original precisely.

:**** shows the word which can not be translated. 3.In the drawings, any words are not translated.

VRITTEN AMENDMENT

[Filing date]Heisei 18(2006) October 4 (2006.10.4) Written Amendment

Document to be Amended]Claims

Amendment 1]

Item(s) to be Amended[Whole sentence Method of Amendment]Change

The contents of amendment

it has a alicon containing functional group which can construct a bridge by forming on silicon a silocan selioxane bond which has three or more hydrolytic bases, an organic polymer (A1) which is at least one Claim 1

sort as which a principal chain skeleton is chosen from an acrylic ester system copolymer obtained by polyoxyalkylene series polymer, saturated hydrocarbon system polymer, and a living-radical-

A silanol condensation catalyst which is at least one sort chosen from carboxylic acid tin salt (C), an polymerization method (meta-) — and

organic tin catalyst (D), and a non-tin catalyst (E) 4 containing hardenability constituent.

A silicon containing functional group which can construct a bridge by forming a siloxane bond is a Claim 2

general formula (6): :

The hardenability constituent according to claim 1 characterized by what is expressed with (the - Si(OR⁴) ₃ (6)

inside of a formula and three R^4 are the organic groups of monovalence of the carbon numbors $2 ext{--}20$ independently, respectively).

he hardenability constituent according to claim 1 or 2, wherein a silicon containing functional group which can construct a bridge by forming a siloxane bond is a triethoxy silyl group.

An organic polymer in which an organic polymer (A1) introduced an unsaturation group into an end. Claim 4

X show a hydroxyl group or a hydrolytic basis among a formula, and three X may be the same and and a general formula (2):

may differ.) — a hardenability constituent given in any 1 paragraph of Claims 1-3 being the organic colymers obtained by an addition reaction with a hydrosilane compound expressed.

An organic polymer in which an organic polymer (A1) introduced an unsaturation group into an end, and a general formula (9): A hardenability constituent given in any 1 paragraph of Claims 1-4 baing the organic polymers obtained by an addition reaction with a hydrosilane compound expressed with (the inside of a formula

nd three R⁴ are the organic groups of monovalence of the carbon numbers 2-20 independently.

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espectively).

A hardenability constituent given in any 1 paragraph of Claims 1-5 to which an organic polymer (A1) is characterized by being an organic polymer which does not contain an amide segment (-NH-CO-)

substantially in a principal ohain skeleton.

A hardenability constituent given in any 1 paragraph of Claims 1-6 which a silanol condensation catalyst is carboxylic acid tin salt (C), and are characterized by containing an amine compound

The hardenability constituent containing an organic tin catalyst (D) according to claim 7.

Claim 8

Z expresses among a formula an organic group which has a functional group with which Q can form a coordinate bond in an inside of a hydrocarbon group of monovalence of the carbon numbers 1-20, or An organio tin catalyst (D) Dialkyl tin carboxylate, dialkyl tin oxide, $Q_g \mathrm{Sn}(\mathrm{OZ})_{4-g}$ and $[Q_2 \mathrm{Sn}(\mathrm{OZ})]_2 \mathrm{O}$ Claims 1-6 being at least one sort chosen from a group which consists of a compound shown, and a hardenability constituent given in any 1 paragraph of 8. self for a hydrocarbon group of monovalence of the carbon numbers 1-20 to Sn.) g is 0, 1, 2, or 3. Claim 9]

A hardenability constituant given in any 1 paragraph of Claima 1–8 to which carboxylic acid tin salt (C) is characterized by a carbon atom which adjoins a carbonyi group being the carboxylic acid tin salt (C1) which is the 4th class carbon. A hardenability constituent given in any 1 paragraph of Claims 1-6 which said non-tin catalyst (E) is carboxylic acid, and are characterized by containing amine further.

The hardenability constituent according to claim 11, wherein a carbon atom in which carboxylic acid adjoins a carbonyl group is carboxylic acid which is the 4th class carbon.

A hardenability constituent given in any 1 paragraph of Claims 1-12 containing a minute hollow body Claim 13

Claim 14

A hardenability constituent given in any 1 paragraph of Claims 1-12, wherein an organic polymer (A1) is 5 to 28 % of the weight in a total amount of a hardenability constituent.

A hardenability constituent given in any 1 paragraph of Claims 2-12 containing epoxy resin (I). Claim 15

The hardenability constituent according to claim 16, wherein silicate is a condensate of tetra A hardenability constituent given in any 1 paragraph of Claims 1-12 containing silicate (B). Claim 17]

A general formula (7): Claim 18]

a koxvsilane.

Claim 16]

- SIR⁵ (OR⁸) _{3-c} (7)

independently, and 3-c R⁶, respectively) It is an organic group of monovalence of the carbon numbers paragraph of Claims 2-12 containing an aminosilane coupling agent (G) which has a basis expressed 2-20 independently, and c shows 0, 1, or 2, respectively. A hardenability constituent given in any 1 Among a formula, $o R^5$ is the organic groups of monovalence of the carbon numbers 1-20

Claim 19]

The hardenability constituent according to claim 18, wherein a basis expressed with the above-mentioned general formula (7) is a triethoxy silvi group.

A general formula (6):

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forming a siloxane bond axpressed with (the inside of a formula and three R4 are the organic groups of monovalence of the carbon numbers 2-20 independently, respectively), and a ganeral formula (8) : An organio polymer which has a silicon containing functional group which can construct a bridge by

formula, respectively, R⁸ of a 3-d-c individual is an organic group of monovalence of the carbon (d R7 is the organic groups of monovalence of the carbon numbers 1-20 independently among a - SIR7, (OCH,), (OR⁸) 3-d-1, (8)

2-12 which are the hardenability constituents containing an aminosilane coupling agent (H) which has lowever, 3-d-e>=0 shall be satisfied. A hardenability constituent given in any 1 paragraph of Claims numbers 2-20 independently, and d shows 0, 1, or 2 and, as for e, it shows 1, 2, or 3, respectively.) a basis expressed, and are characterized by recuperating oneself beforchand in this hardenability

constituent Claim 21]

A general formula (6) : - Si(OR⁴)₃ (6)

An organic polymer which has a silicon containing functional group which can construct a bridge by orming a siloxane bond expressed with (the inside of a formula and three R4 are the organic groups obtained by carrying out the ester exchange reaction of the compound $\langle J \rangle$ which has at least one of monovalence of the carbon numbers 2-20 independently, respectively), A general formula (10)

nethoxy group which can carry out an ester exchange reaction to an R'O-basis of a general formula

- Si(OCH₂) (OR⁴) 3-7 (10)

independently, respectively, and f shows 1, 2, or 3.) — a manufacturing method of an organic polymer having a silicon containing functional group which can construct a bridge by forming a siloxane bond (among a formula, 3–f R⁴ is the organic groups of monovalence of the carbon numbers 2–20

[Claim 22]

A silanol condensation catalyst which is at least one sort chosen from carboxylic soid tin salt (G), an an organic polymer obtained with a manufacturing method of Claim 21 — and organic tin catalyst (D), and a non-tin catalyst (E)

A containing hardenability constituent.

An object for interior panels containing Claims 1-20 and a hardenability constituent given in any 1 paragraph of 22, an object for face panels, or adhesives for car panals.

A sealing material for working joint containing Claims 1–20 and a hardenability constituent given in any 1 paragraph of 22 of a building.

Amendment 2

Item(s) to be Amended]Whole sentence Document to be Amended Description Method of Amendment]Change

[Detailed Description of the Invention] The contents of amendment

This invention relates to the hardenability constituent containing the organic polymer which has a Field of the Invention 000

it is known that the organic polymer which contains at least one reactive silloon group in a molecule has the interesting character in which construct a bridge by formation of the siloxane bond Background of the Invention] by forming a siloxane bond.

silicon containing functional group (henceforth a reactive silicon group) which can construct a bridge

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accompanied by the hydrolysis reaction of a reactive silicon group, etc., and a rubber-like hardened naterial is obtained with hygroscopic auriace moisture etc. also in a room temperature.

in the polymer which has these reactive silicon groups, a polyoxyalkylene series polymer and a

polyisobutylens system polymer are already produced industrially, and are widely used for uses, such as a sealing material, adhesives, and a paint.

may pass with prudence and the stress from the outside of adherend, it may change by the time, and and creep resistance are bad, an adhesives layer may pass, and it may change by the time, and may inferior to stability or crosp resistance, an adhesives layer may pass and it may change by the time, wall, the adhesives for oar panels, etc. is inferior to stability or creep resistance, an adhesives layer a panel tile, a stone, etc. may shift. Also in ceiling finishing adhesives or floor finishing adhesives, if electric equipment, an electron, and the adhesives for precision-mechanical-equipment assemblies be connected with the degradation of apparatus. Therefore, it is called for that the constituent for adhesives for stone tensions, When the resin for adhesives used for the adhesives for finishing of and unevenness of a ceiling surface or a floor line may arise. If the stability of the electrical and The adhesives for interior panels, the adhesives for face panels, the adhesives for tiling the these adhesives is excellent in stability or creep resistance.

over a long period of time is very important, excelling in stability or endurance is called for as physical for a sealing material, the scaling material for direct grazing, the scaling material for multiple glass, the width (Kasagi) the circumference of glass, the circumference of a window frame and a aash, a curtain wall, and various face panels — business — stability and endurance excellent in the constituent used used in order to give watertight and sirtightness. Therefore, since the flattery nature to the use part A sealing material generally fills up the joined part and cravice between various members, and he is properties of a hardened material. Working joint of a building with an especially large change of joint scaling material for speed signal generator construction methods, etc. are called for.

mainly indicated, and the description which suggests stability, creep resistance, and endurance is not constituent which uses as an essential ingredient the organic polymer which has the reactive silicon the (patent documents 4), (The patent documents 5), the (patent documents 6), the (patent documents 7), the (patent documents 8), (The patent documents 9), the (patent documents 10), the documents 14), the (patent documents 15), the (patent documents 16), (The patent documents 17), On the other hand, (the patent documents 1), the (patent documents 2), the (patent documents 3), the (patent documents 18), the (patent documents 19), the (patent documents 20), In (the patent documents 21, the (patent documents 22), the (patent documents 24), group which three hydrolytic bases combined on silicon is indicated. In these advanced technology, the fast curability based on the reactive silicon group which three hydrolytic bases combined is the (patent documents 25), the (patent documents 26), the (patent documents 27), the (patent documents 28), and the (patent documents 29). Although the room-temperature-curing nature (patent documents 11), the (patent documents 12), (The patent documents 13), the (patent

Patent documents 2] JP,H10-245484,A Patent documents 3] JP,H10-251552,A Patent documents 4] JP,H10-324793.A Patent documents 5] JP,H10-330630,A Patent documents 6] JP,H11-12473,A Patent documents 7] JP,H11-12480,A Patent documents 8] JP,H11-21463,A atent documents 9] JP,H11-29713.A

Patent documents 1] JP,H10-245482.A

ndicated.

Patent documents 12] JP,H11-116831,A Patent documents 13] JP.H11-124509,A

Patent documents 10] JP,H11-49969,A Patent documents 11] JP,H11-49970,A

Patent documents 14] WO No. 47939 [98 to] Patent documents 16] JP,2000-109676,A Patent documents 15] JP.2000-34391,A

Patent documents 19] JP,2000-129126,A JP,2000-109678,A Patent documents 20] JP,2000-129145,A Patent documents 18]

Patent documents 17] JP,2000-109677,A

Patent documents 21] JP.2000-129146,A Patent documents 23] JP.2000-136312.A Patent documents 24] JP,2000-136313,A Patent documents 22] JP.2000-129147,A

Patent documents 25] JP,2000-239338,A Patent documents 27] JP,2001-72854,A Patent documents 26] JP,2001-55503,A

Patent documents 28] JP,2001-72855,A

Patent documents 29] JP,2000-327771.A Description of the Invention]

Problam(a) to be Solved by the Invantion

An object in view of the above-mentioned actual condition of this invention is to provide the stability, ceiling finishing adhesives. Floor finishing adhesives, the adhesives for finishing of wall, the adhesives nterior panels with which atability, endurance, and creep rasistance have been improved as for this evention, The adhasives for face panels, the adhesives for tiling, the adhesives for atone tensions, for car panels, the electrical and electric equipment, an electron and the adhesives for precisionandurance, and creep resistance corrective strategy of a hardened material. The adhesives for

mechanical-equipment assemblies, It aims at providing the sealing material for direct grazing, the provide the hardenability constituent which can give the hardened material excellent in stability, sealing material for multiple glass, the sealing material for speed signal generator construction methods, or the sealing material for working joint of a building. An object of this invention is to

andurance, and oreep resistance Means for Solving the Problem] 3y using on silicon a silicon containing functional group which has three or more hydrolytic bases as invention persons may solve such a problem, It found out improving stability, endurance, and creep reactive silicon group of this polymar, as a result of inquiring wholeheartedly, in order that this esistance, and this invention was completed.

oolymer (A1) which is at least one sort as which a principal chain skeleton is chosen from an acrylic ster system copolymer obtained by polyoxyalkylene series polymer, saturated hydrocarbon system containing functional group which can construct a bridge by forming a siloxane bond, an organic Namely, the 1st of this invention has three or more hydrolytic bases on silicon. It has a silicon oolymer, and a living-radical-polymerization method (meta-) --- and

A silanol condensation catalyst which is at least one sort chosen from carboxylic acid tin salt (C), an it is related with a containing hardenability constituent. organic tin catalyst (D), and a non-tin catalyst (E)

A silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment is a general formula (6). - Si(OR*)

ormula and three R⁴ is an organic group of monovalence of the carbon numbers 2-20 independently. It is related with said hardenability constituent characterized by what is expressed with (inside of

A silicon containing functional group which can construct a bridge by forming a siloxane bond as a

ttp://www4.ipdLinpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdLi.. 2010/05/06 desirable embodiment is related with said hardenability constituent being a triathoxy ailyl group.

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An organic polymar in which an organic polymor (A1) introduced an unsaturation group into an end as

a desirable embodiment, and general formula (2) :

(X show a hydroxyl group or a hydrolytic basis among a formula, and three X may be the same and may differ.) — it is related with said hardenability constituent being an organic polymer obtained by in addition reaction with a hydrosilane compound expressed An organic polymer in which an organic polymer (A1) introduced an unsaturation group into, an end as a desirable embodiment, and general formula (9): I-Si(OR*), (9)

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reaction with a hydrosilane compound expressed with (inside of formula and three $\mathbb{R}^{\frac{1}{2}}$ is an organic It is related with said hardenability, constituent being an organic polymer obtained by an addition group of monovalence of the carbon numbers 2-20 independently, respectively).

As a desirable embodiment, an organic polymer (A1) is related with said hardonability constituent being an organic polymer which does not contain an amide segment (-NH-CO-) substantially in a principal chain akeleton

As a desirable embodiment, a ellenol condensation catalyst is carboxylic soid tin salt (C), and it is related with said hardenability constituent containing an amine compound further.

t is related with said hardenability constituent further characterized by containing an organic tin

catalyst (D) as a desirable embodiment.

monovalence of the carbon numbers 1–20, or self for a hydrocarbon group of monovalence of the carbon numbers 1–20 to Sn. g is 0, 1, 2, or 3. It is related with said hardenability constituent being at An organic tin catalyst (D) as a desirable embodiment Dialkyl tin carboxylate. Dialkyl tin oxide and functional group with which Q can form a coordinate bond in an inside of a hydrocarbon group of Q SN(OZ) 4-8 and [Q2Sn(OZ)] 20 (among a formula) Z expresses an organic group which has a least one sort chosen from a group which consists of a compound shown.

group is related with said hardenability constituent being the carboxylic acid tin sait (C1) which is the As a desirable embodiment, a carbon atom in which carboxylic acid tin salt (0) adjoins a carbonyl th class carbon.

As a desirable embodiment, said non-tin catalyst (E) is carboxylic acid, and it is related with said nardenability constituant containing amine further, As a desirable embodiment, a carbon atom in which carboxylic acid adjoins a carbonyl group is related with said hardenability constituent being carboxylic acid which is the 4th class carbon

It is related with said hardenability constituent further characterized by containing a minute hollow body (F) as a desirable embodiment. it is related with said hardenability constituent characterized by an organic polymer (A1) being 5 to 28 % of the weight in a total amount of a hardenability constituent as a desirable embodiment.

It is related with said hardenability constituent further characterized by containing epoxy resin (I) as

it is related with said hardonability constituent further characterized by containing silicate (B) as a desirable embodiment

Jasirabla embodiment.

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As a desirable embodiment, silicate is related with said hardenability constituent being a condensate of tetra alkoxysliane.

yozoz $_1$ As a desirable embodiment, it is a general formula furthor $(7)_{-}$: $- \mathrm{SiR}^5_{-}(\mathrm{OR}^9)_{-9-c}(7)$

 $(e R^2)$ is an organic group of monovalence of the carbon numbers 1–20 independently among a formula, respectively, and 3–c R^3), it is an organic group of monovalence of the carbon numbers 2–20

independently, and a shows 0, 1, or 2, respectively. It is related with said hardenability constituent containing an aminosilane coupling agent (6) which has a basis expressed.

0027) It is rojstad with said hardenability constituent, wherein a basis expressed with the above-mentioned general formula (7) is a triethoxy silv) group as a desirable embodiment.

coresia Johnson (1) sa unoutez esta para a constante (20) 20028] No a desirable embediment, it is a general formula (6) :

-Si(Ωt²)₂ (θ) An organic polymer which has a silicon containing functional group which can construct a bridge by forming a paison be not descreted with (inside of formula and three Pt²₁ is an <u>corpside group of</u> conceined as the carbon numbers -2-20 independently resentively, and enemal formula (B):

forming a allocane bond expressed with (naide of formula and three R² is an organic group of monovalence of the carbon numbers 2-20 independently, respectively), and general formula (8) : $\overline{SR}^2_{-1}(OCH_{\frac{1}{2}})_{\overline{Q}(OR)}^2$ (OCH₂).

It is an except one of monostance of the action times. 1.2 in intellectivity monit, it is for extended that a consistent of an action of an action of the action of the action of the action of monostance of the action action of the action of monostance of the action action of the action of monostance of the action action of the action of

0029] 'he 2nd general formula (6) of this invention :

 $-S_1(OH^3)_3$ (6) An organic polymer, which has a allicon containing functional group which can construct a bridge by regarding a alloane band capteged with finishe of formula and three R_1^2 is an organic group of monomalience of the orbon numbers $P_2(0)$ independently, respectively), General formula (10) obtained monomalience of the orbon numbers $P_2(0)$ independently, respectively), General formula (10) obtained

by currying out the exter exchange reaction of the compound (J. Which has at least one methony groun which ean earn sout an exter exchange reaction to an R²O-basis of a general formula (0): $-810004\mu_{\rm p}/600^{\circ}$ or (10)

imong a formuly, 3–16½ is an organic group of monovalence of the carbon numbers 2–20 inopportantly respectively, and f shows 1, 2, or 3)— it is reliated with a manufacturing method of an organic object having an around scruting method of an advanted respectively, and it shows 1, 2, or 3)— it is reliated with a manufacturing method of an advanted as inform containing functional group which can constituted a bridge by forming a soloure bond expressed.

(1003)

A aliende polymer obstäted with seid manufenturing mosbool as a Literirable embodiment. — and
A aliende connectation exhibity which it as the text chosen from canboxylic soof this self (CO, an
extension in quality (C), and a non-this catablest (E).

t is related with, a containing hardensbillty constituent.

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10 related with an object for interior panels obstractorized by containing said hardensbillty

10 related with an object for interior panels obstractorized by containing said hardensbillty

10 related with an object for interior panels obstract for face panels, or adhesives for car panels.

[0032] It is related with a sealing material for working joint of a building characterized by containing said

ardenability constituent as a desirable embodiment. 0033]

fereafter, this invention is explained in detail.

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UU349. Restriction in particular does not have a principal chain skeleton of an organic polymer (A) which has a reactive silenion. group used for this livvention, and it can use a thing with various kinds of principal chain skeletona.

copolyamide, A diallyl phthalate system polymer etc. are illustrated. A polyoxyalkylene series polymer polymerization of adipic acid and hexamathylenediamine, and sebacic soid. Nylon 11 by condensation carrying out condensation polymerization from polyamide system polymer,, for example, bisphenol A, butyl (meta) acrylatc (meta); (meta). An acrylio ester system monomer, vinyl acetate, acrylonitrile, A polymerization of epsilon-aminoundecanoic acid, A polycarbonate system polymer manufactured by opening polymerization of epsilon-amino RAURO lactam, and the above-mentioned nylon, such as vinyl-base polymer produced by carrying out the radical polymerization of the monomers, such as atyrene; A vinyl monomer in inside of said organic polymer is polymerized. Graft polymer, obtained polymer obtained by ring opening polymerization of lactone; Ethyl (meta) acrylate, An acrylic ester Polysulfide system polymer; Nylon 610 by condensation polymerization of nylon 6 by ring opening system copolymer produced by carrying out the radical polymerization of the monomers, such as copolymer, a polycarbonate system polymer, etc. are preferred from acquisition and manufacture polymers; Condensation with dibasic acid, such as adipic acid, and glycol, Or a polyester system and carbonyl chlorides which have a two or more-ingredient ingredient among Nylon 12 by ring polyisoprene, isoprene or butadiene, acrylonitrile, styrene, etc.. A copolymer with polybutadiene, isoprene or butadiene, acrylonitrile, styrene, etc., Hydrocarbon system polymers, such as a nydrogenation polypicfine system polymer produced by hydrogenating these polyplefine system Specifically A polyoxyethylene, polyoxypropylene, polyoxy butylene, Polyoxy tetramethylen, a a hydrocarbon system polymer, a polyester system polymer, an acrylic ester (meta) system polyoxypropylene polyoxy butylene copolymer, An ethylene-propylene system copolymer, A copolymer of polyisobutylene, isobutylene, isoprene, etc., polychloroprene, A copolymer with polyoxyethylene polyoxypropylene copolymer, Polyoxyalkylene series polymers, such as a polymerization of epailon caprolactam, hexamethylenediamina, Nylon 66 by condensation being easy among polymers with the above-mentioned principal chain skeleton.

Startated hydrocarbon system polymers, such as polyiochtrylene, hydrogenation polyiocperon, and Startated hydrocarbon system polyimers, such a polyocyalitylene aeries polymer and an arrylio saster (netal) hydrogenation polyburbalism, and a polyocyalitylene aeries polymer and an arrylio saster (netal) attation copylene have a comparativity from gaste transfer between the and third hardoned material obtained is referred esspecially from oxolifing in odd resistance. In a principal chain skalaton of the above-mentioned organic polymer (A), other ingredients, such as a unchann bond ingredient, may be included in the range which does not spoil an affect of this invention greatly, refer

It is not limited especially as the abova-mentioned urethane bond ingredient, but For example

toleno (Cubylen) discoparate. Aventure oyean policonsensite, and as independental discoparate and adviser discoparate. Independent discoparate discoparate discoparate discoparate. Independent discoparate discoparate discoparate discoparate discoparate discoparate discoparate. Independent discoparate commonté, such se alphatic series system polyicoparates, uch se hexametripleso de riscoparate, and pojol which has various kinds of abover-mentioned principal chian skeletons can be mentioned.

De mentioned.

if there are many unite agenment. All COD personated in principal chair addition that on a side constitution of a side constitution of the constitution of the constitution of workability. Interfor, as for examtly of an amide segment occupied in a principal chair additional chair additional constitution of an amide segment occupied in a principal chair additional chair and example of the workability. Therefore, as for prediver that it is a fore last of the weight, it is more profuncial that it is not septemental that it is not included substantially in the constitution of the

A reactive allicon group contained in an organic polymer which has a reactive allicon group is a basis whith can construct a bridge by therming a absonabe bod by the masterior which has a hydroxyl group or a hydrolytic basis combined with a allicon atom, and is accelerated by a allinoir confideration or a hydrolytic basis combined with a allicon atom, and is accelerated by a allinoir confideration.

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catalyst. As a reactive silicon group, it is a general formula (11).: - (SIR¹ _{2-b}X _bO) _m-SIR² _{3-a}X _a (11)

lifferent. When the Tori ORGANO siloxy group shown by aryl group of the carbon numbers 6-20, an in alkyl group of the carbon numbors 1-20 from which R¹ in a formuls and R² were the same as or sralky group of the carbon numbers 7-20, or (R) siO- is shown and R1 or two or more R2 exist, they may be the same and may differ. R' is a hydrocarbon group of monovalence of the carbon

sydrolytic basis, and when two or more X exists, they may be the same and may differ. As for a, 0, 1, 2, or 3b shows 0, 1, or 2, respectively. About b in m bases (SiR¹ 2-b X b 0), they may be the same and may differ. m shows an integer of 0 to 19, however — what satisfies a+sigma b>=1 — carrying out jumbers 1-20 here, and three R' may be the same and may differ. X shows a hydroxyl group or a

especially as a hydrolytic basis. Specifically, a hydrogen atom, a halogen atom, an alkoxy group, an It is not limited but what is necessary is just a conventionally publicly known hydrolytic basis

a basis expressed is raised.

these, a hydrogen atom, an alkoxy group, an acyloxy group, a KETOKISHI mate group, an amino group, soyloxy group, a KETOKISHI mate group, an amino group, an amide group, an acid-amide group, an aminooxy group, a sufflydryl group, an alkenyloxy group, etc. are mentioned, for example. Among an amide group, an aminooxy group, a suifhydryl group, and an alkenyloxy group are preferred. hydrolysis nature is quiet and a viewpoint of handling or a cone to especially an alkoxy group is

A hydrolytic basis and a hydroxyl group can be combined with one silicon atom in the 1–3 ranges, and

(areigmab) has 1-5 proferred ranges. When a hydrolytic basis and a hydroxyl group join together in I two or more 1 a reactive silicon group, they may be the same and may differ.

in particular, it is a general formula (12).

R2 and X are the same as the above among a formula.) Since a reactive silicon group expressed with - SIR² 3-a X a (12)

an integer of 1-3 is easy to receive, a's is preferred.

aralkyl groupa, auch as aryl groups, such as cycloalkyl groups, such as alkyl groups, such as a methyl siloxy group R' is indicated to be by 3SIO- which is a methyl group, a phenyl group, etc. (R), etc. are group and an ethyl group, and a cyclohexyl group, and a phenyl group, and benzyl, the Tori ORGANO 4s an example of R¹ in the above-mentioned general formula (11) and (12), and R², For example,

alsed. Especially in these, a methyl group is preferred.

group, a triisopropoxy silyl group, a dimethoxymethyl silyl group, a dicthoxymethylsilyl group, and a As more concrete illustration of a reactive silicon group, a trimethoxysilyl group, a tricthoxy silyl

Especially in this invention, an organic polymer which has the silicon containing functional group (that is, the number of arbxm of a general formula (11) is three or more) which three or more hydrolytic bases combined on silicon in an organic polymer of the (A) ingredient can be used as an ingredient lisopropoxy methyl silyl group are mentioned.

silion, and constructed the bridge by a siland condensation reaction of that reactive silicon group. Good stability is shown and remarkable creep resistance and an endurance improvement effect are A hardened material which three or more hydrolytic bases had combined this (A1) ingredient on

A1) As for the number of a+bxm of a general formula (11) of an ingredient, it is more preferred that it. ess hydrolytic bases.

shown as compared with a oase of reactive silicon group containing organic polymer which has two or

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is 3-5, and especially 3 is preferred. Also in it, since [that its improvement effect of the stability of a ulkoxyl group of the carbon numbers 1-20 is prafarred, its thing of tha carbon numbers 1-10 is more hardenability constituent of this invantion, endurance, and creep resistance is especially large and] trimethoxysilyl group and a triethoxy silyl group are the most preferred. Hardonability may booome the Tori alkoxy silyl groups has the good availability of a raw material, it is preferred. Thing of an preferred, and its thing of the carbon numbers 1-4 is still more preferred here. Specifically, a

ate when a carbon number is larger than 20.

containing organic polymer in a hardenability constituent. Therefore, five to 28% of the weight, when it rs. However, if an ingredient (A1) of this invention is used as reactive silicon group containing organic constituent is compatible in low cost and high endurance, it is more preferably preferred [rate] ten s 15 to 24 % of the weight especially preferably, since a rate of an ingredient (A1) in a hardonability constituent becomes low, it is known that the endurance of a hardened material obtained will fall to polymer, high endurance is maintainable even if it makes low weight % of reactive silicon group Benerally, if weight % of reactive silicon group containing organic polymer in a hardenability to 26% of the weight.

aspecially in this invention, an organic polymer which has the Tori alkoxy sllyl groups of the carbon numbers 2-20 can be used as a (A4) ingredient in an organic polymar of an ingredient (A1). Namely, general formula (6): 0000

(three R⁴ is the organic groups of monovalence of the carbon numbers 2-20 independently among a formula, respectively.) — an organic polymer which has a basis expressad can ba used as a (A4) - Si(OR*) 3 (6)

it is known that methanol generated in connection with a hydrolysis reaction of a methoxy slipl group has peculiar toxicity of causing an obstacle of an optic nerve. On the other hand, since a carbon ingredient

number of an alkoxy group which combines the (A4) ingredient with a silicon atom is 2 to 20, toxic high methanol is not contained in alcohol generated in connection with a hydrolysis reaction of a reactive silicon group, but serves as a constituent with high safety at it.

generated by hydrolysis has the highest safety, it is the most preferred [as for a carbon number of (A4) It is preferred that it is especially 2-4, and when it is 2, it serves as ethanol, and since alcohol

Specifically, a triathoxy silyl group is the most preferred. Whan a carbon number is larger than 20, while the hardenability of a hardenability constituent may become late, an anasthetic action and R4 of a general formula (6) of an ingradient, it is more preferred that it is 2-10, and / alcohol]. atimulation of alcohol to genarate may be large.

Especially in this invention, a principal ohain skoloton oan use as a (A6) ingredient what is polyoxyalkylene in an organio polymer of the (A4) ingredient. Namely, general formula (6) :

A polyoxyalkylone series polymer which has a basis expressed with $(\mathbb{R}^4$ in a formula is the same as - Si(OR*) 3 (6)

i.1-5 reactive silicon groups of an organic polymer (A) exist preferably [that average per molecule and at least one piece exists], and more preferably. If the number of reactive silicon groups the above) can be used as a (A5) ingredient. [0054]

effective network chain density of an organic polymer (A) ingredient contained in a hardened material formed eventually will increase if a reactive allicon group exists in an and of a chain, a rubber-like silicon group may exist in an end of an organic polymer (A) chain, and may exist in an inside. Since hardaned material in which a low elastic modulus is shown bacomes is easy to be obtained by high become insufficient and will become difficult to reveal a good rubber elasticity action. A reactive contained in one molecule of organic polymers (A) will be less than one piece, hardenability will ntensity and high elongation. nttp://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.lpdl.i.. 2010/05/06

Especially in this invention, an organic polymer the number of reactive silicon groups per molecule averages, and 1.7-5 pieces exist in an organic polymer of the (A) ingredient can be used as an

eaction of that reactive silicon group. Good stability is shown, the number of reactive silicon groups oer molecule averages, and remarkable crosp resistance and an endurance improvement effect are A hardened material which the numbar of reactive silicon groups per molacule averaged this (A2) ingredient for it, and 1.7-5 pieces axisted, and constructed the bridge by a siland condensation shown as compared with a case of less than 1.7 organic polymers.

hat they are 2-4 pieces, and it is preferred that they are especially 2.3-3 pieces. When there are few A2) As for the number of reactive silicon groups per molecule of an ingredient, it is more preferred 1.7 reactive silicon groups per molecule, an improvement effect of the stability of a hardenability

constituent of this invention, endurance, and creep resistance may not be enough, and when larger than five pieces, elongation of a hardened material obtained may become small.

Especially at this Invention, it is a general formula in an organic polymer of the (A) ingredient (3). : -O-R3-CH(CH3)-CH2-(SIR12-bX bO) _-SIR23-x (3)

show and] R1 R2 X, a, b, and m -- the above -- it is the same -- an organic polymer which has a sorts chosen from a group which consists of hydrogen, oxygan, and nitrogen as a composition atom) R³ in a formula a divalant organic group of the carbon numbers 1-20 which contain one or more structure part with which it is expressed can be used as a (A3) ingredient. A hardened material which this (A3) ingredient has a structure part expressed with a general formula 3), and constructed the bridge by a silanol condensation reaction of that reactive silicon group

shows good stability, and shows remarkable creep resistance and an endurance improvement effect as compared with a case of an organic polymer which has terminal structures other than a general As for a carbon number of R3 of a general formula (3), it is more preferred from a point of availability hat it is 1-10, and it is preferred that it is especially 1-4. Specifically, R³ has the most preferred

methylene group.

(A3) An ingredient is a genaral formula (5).

-0-R3-CH(CH,)-CH,-SIX, (5)

nardenability constituent of this invention, endurance, and crasp resistance is especially large and J (R³ in a formula and X ara the same as the above.) -- when it is an organic polymer which has a structure part with which it is expressed, since [that an improvement affect of the stability of a

the availability of a raw material is good, it is desirable.

(A) What is necessary is just to perform introduction of a reactive silicon group of an ingredient by a publicly known method. That is, the following methods are mentioned, for example.

unsaturation group content organicity polymer is obtained by copolymentation with an unsaturation group content epoxy compound. Subsequently, hydrosilane which has a resotive silicon group is made reactivity to an organic polymer which has functional groups, such as a hydroxyl group, in a molecule this functional group react, and obtain an organic polymer containing an unsaturation group. Or an b) Make an organic compound which has an active group and an unsaturation group which show

;ee) Make a compound which has a sulfnydryl group and a reactive silicon group react to an organio bolymer containing an unsaturation group produced by making it be tha sams as that of the (b)

to act on an acquired resultant, and it hydrosilylates.

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reactivity to an organic polymer which has functional groups, such as a hydroxyl group, an epoxy **) Make a compound which has a functional group and a reactive silicon group which show

group, and an isocyanata group, in a molacule to this functional group react.

becoming a good hardenability constituent of workability by hypoviscosity rather than an organic polymer obtained by a method of (₹≢) have the strong nydroxyl group react to an end a method of (b) or among (**)s in the above method is preferred. An Since a high inversion rata is obtained in comparatively short reaction time, a mathod of making a compound which has a polymer, an isocyanate group, and a reactiva silicon group which have a organic polymer which has the reactive silicon group obtained by a method of (b), (**) Since and smell based on an mercaptosilane, especially its method of (b) is preferred. b) As an example of a hydrosilane compound used in a method, For example, trichlorosilane, methyldi chlorosilicane, dimethylchlorosilicane. Halogenation Silang like phenyl dichlorosilane, Trimethoxysilane, limethoxysilane; Methyldi acetoxysilane, The acyloxy silanes like a phenyldiacetoxysilane; although nalogenation Silang and alkoxysilane are preferred, especially alkoxysilane has the quiet hydrolysis nature of a hardenability constituent obtained, and it is the most preferred to a handling and cone the KETOKISHI mate silanes like bis(dimethyl KETOKISHI mate)methylsilane and bis(oyclohexyl KETOKISHI mate) methylsilane are raised, it is not limited to thesa. Especially among these, Triethoxysilane, methyldiethoxysilane, methyl dimethoxysilane, The alkoxysilane like phenyl

in the above-mentioned hydrosilane compound, it is a general formula (2). 0068

H-SiX, (2)

especially large improvement effect of the stability of a hardenability constituent which consists of an organic polymer obtained by an addition reaction of this hydrosilane compound, endurance, and creep trialkoxysilane, such as trimethoxysilane, triethoxysilane, and a triisopropoxy silane, is more preferred Since a hydrosilane compound expressed with (X in a formula is the same as the above) has an resistance, it is preferred. In a hydrosilane compound expressed with a general formula (2),

group) of 1 also in said trialkoxysilane is like [when disproportionation may advance quickly and disproportionation progresses] dimethoxysilane — a dangerous compound arises in inside. From a trialkoxysilane in which carbon numbers, such as trimethoxysilane, have an alkoxy group (methoxy

viewpoint of asfaty on handling to a general formula (9):

It is preferred to use trialkoxysilane which has an alkoxy group whose carbon number expressed with (R⁴ in a formula is the same as the sbove) is two or more. A viewpoint of availability, asfety [on handing] stability [of a hardenability constituent obtained], endurance, and creep resistance *** to triethoxysilane is the most preferred.

radical addition reaction under a radical initiator and/or radical source-of-release existence, for compound which has a sufflydry! group and a reactive silicon group as a synthetic method by a (**) Although a method of introducing into an unsaturation binding site of an organic polymer a

0070

example, etc. are mentioned, it is not limited in particular. As an example of a compound of having triethoxysilane, gamma-mercapto propylmethyl diethoxysilane, etc. are raised, it is not limited to propyltrimethoxysilane, gamma-mercaptpropylmethyl dimethoxysilane, gamma-mercaptopropyl said sulfhydryl group and a reactive silicon group, For example, although gamma-meroapto

mathod of making a compound which has a polymer, an isocyanate group, and a reactive silicon group (**) Although a method etc. which are shown in JP,H3-47825,A are mentioned, for example as a which have a hydroxyl group reacting to an end among synthetic mathods, it is not limited in nttp://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwvw4.ipdli... 2010/05/06

particular. As an example of a compound of having said isocyanate group and a reactive silicon group. For example, although gamma-iacoyanate propyttrinethoxysilane, gamma-iacoyanate propylmethyl dimethoxysilane, gamma-isocyanatepropyl triethoxysilane, gamma-isocyanate propylmethyl

liethoxysilane, etc. are raised, it is not limited to these.

As mentioned above, as for a silane compound which three hydrolytic bases have combined with one which especially carbon numbers, such as trimethoxystlane, have an alkoxy group (methoxy group) of silicon atoms, such as trimethoxysilane, disproportionation may advance, As for trialkoxysilane in

disproportionation may advance quickly. If disproportionation progresses, a remarkable dangerous either gamma-mercapto propyltrimethoxysilane nor gamma-isocyanate propyltrimethoxysilane. For rimethoxysilyl group, as a silicon content group, it is preferred to use a synthetic method of (**) or compound [like] which is dimethoxysilane will arise. However, such disproportionation advances in his reason, when using the Tori alkoxy silyl groups which has methoxy groups, such as a

As how to obtain an organic polymer which has the silicon content group combined with a methoxy group, it is one method of the above-mentioned (***), (***), and (***), and a reactive silicon group is a

reaction after obtaining an organic polymer (getting it blocked the above-mantioned (A4) ingredient) 4 compound (J) which has at least one methoxy group which can carry out an estar exchange general formula (6). :

which has a basis expressed with (R4 in a formula is the same as the above). It is a general formula by carrying out an ester exchange reaction under existence of a transesterification catalyst or

Si(OCH₃) (OR⁴) 3-f (10) nonexistence (10): :

ndependently, respectively, and f shows 1, 2, or 3.) — a method of manufacturing an organic polymer among a formula, 3-f R4 is the organic groups of monovalence of the carbon numbers 2-20

which has a basis expressed can be mentioned. An organic polymer which has a basis expressed with a general formula (10) shows fast curability rather than an organic polymer which has a basis expressed with a general formula (6).

nanufacturing an organic polymar which has a basis expressed with a general formula (10), Without a dengerous compound like dimethoxyraliane by disproportionation nating in the middle of manifactures, there are five later manifacture of interfactures are five later marilla, and side native the later are speed and existing constitution of workshifty by hypoxicography tables that an organic polymer obtained by a method of (*e.), it is more destrable than **), by carrying out an ester exchange reaction to the aforementioned (J) ingredient, A method of n said manufacturing method, after introducing a reactive silicon group especially by a method of

an organic polymer obtained by a method of (**).

As a compound (J) which has at least one above-mentioned methoxy group which can carry out an ester exchange reaction, there is no limitation in particular and various kinds of compounds can be

nethoxy groups on the same silicon atom as a compound which has the silicon atom combined with sspecially a compound that has a silicon atom united with 2-4 methoxy groups on the same silicon A compound etc. which have the silicon atom combined with methyl ester of various kinds of acid, said at least one methoxy group has a quick ester exchange reaction speed, it is preferred. Since ingredient here can be mentioned. Since a compound which has the silicon atom united with 2-4 such as methanol, carboxylic scid, and sulfonic acid, and at least one methoxy group as a (J) atom and an amino group has a quick ester exchange reaction speed, it is preferred

When it illustrates concrately, gamma-aminopropyl trimethoxysilane, gamma-aminopropyl methyl innethoxyailane, gamma-(2-anihoethyl) anihopropyl trimethoxyailane, gamma-(2-amihoethyl) anihopropyl methyl dimethoxyailane, Amiho group content Silang, such as gamma-ureido ttp://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdl3... 2010/05/06

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aminopropyl trimethoxysilane, can be mentioned. A denaturod derivative and a condensation reaction thing of the above-mentioned allane compound can also use the above-mentioned silane compound ropyltrimethoxysilana, N-phenyl-gamma-aminopropyl trimathoxysilane, and N-benzyl-gammaSince an ester exchanga reaction advances also under existence of a transesterification catalyst and comparatively low temperature conditions 60 ** or less, aforementioned amino group content Silang

as a (J) ingredient.

exchange reaction in 0.1-10 copies to 100 copies of reactive silicon group containing organic polymer of the (A4) ingredient. It is preferred to use it in 1-5 copies especially. The above-mentioned (J) As for the (J) ingredient used for this invention, it is preferred to use and carry out an ester ngredient may be used only by one kind, and may carry out two or more kind mixing use.

50,000 in polystyrene conversion in GPC. When there is a tendency whose number average molecular weight is inconvenient in respect of the extension characteristic of a hardened material at less than branching, and the number average molecular weight is 1,000-30,000 more preferably 500 to about An organic polymer (A) which has a reactive silicon group may have straight chain shape or

500 and 50000 is exceaded, aince it becomes hyperviscosity, there is an inconvenient tendency in respect of worksbility

molecular terminal, it is desirable from points, like a rubber-like hardened material of high clongation A reactive silicon group may be in an end or an inside of an organic polymer ohain, and may be in hardened material formed eventually increases especially when a reactive silicon group is in a both. Since effective network chain density of an organic polymer component contained in a becomes is easy to be obtained with high intensity.

Said polyoxyalkylene series polymer is a general formula intrinsically (13). :

[Formula 1]

-Rª-O

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alkylene group of the carbon numbers 1-14.) -- it being a polymar which has a repeating unit shown. among a formula, R⁹ is a divalent organic group and is the straight chain shape or the branching and, R⁹ in a general formula (13) has the carbon numbers 1-14, and also preferred straight chain shape or branched state alkylene group of 2-4. As the example of the repeating unit shown by a general formula (13).

Formula 2]

CHOCHO CH2CH0 -CH2O- --CH2CH2O-----

--CHOCHOCHOOL

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** is mentionad. The principal chain skeleton of a polyoxyalkylana series polymer may consist of ona kind of repeating unit, and may consist of two or more kinds of repesting units. When used especially for sealant etc., it is desirable from that what comprises the polymar which uses a propylone oxide polymar as tha main ingredients is amorphous, or the point which is hypoviscosity comparatively. [0087]

As a synthetic method of a polyoxyalkylene series polymer, For exampla, the polymerizing method by which are shown in JP,61-215623,A react, JP,46-27250,B, JP,59-15336,B, a U.S. Pat. No. 3278457 complex catalyst like a complex produced by making an organoaluminium compound and porphyrin an alkali catalyst like KOH, the polymerizing method by a transition metal compound-porphyrin

tem, a U.S. Pat. No. 3278458 item, A U.S. Pat. No. 3278459 item, a U.S. Pat. No. 3427256 item, a U.S. shown in a U.S. Pat. No. 3427335 item etc., ************* such as the polymerizing method using a Dat. No. 3427334 item, The polymerizing method by a composite metal cyanide complex catalyst colymerizing method using a catalyst which consists of a phosphazene compound illustrated by catalyst which consists of a polyphosphazene salt illustrated by JP,H10-273512.A, and the

4 manufacturing method of a polyoxyalkylene series polymer which has a reactive silicon group. JP.H11-060722.A, are not limited in particular.

4366307, and U.S. Pat. No. 4960844, JP.61-197631,A, 61-215622, 61-215623, Although 6,000 or more JP,45-36319,B, 46-12154, JP,50-156599,A, 54-6096, 55-13767, 55-13468, What is proposed by each gazette, such as 57-164123, JP,3-2450,B, U.S. Pat No. 3632557, U.S. Pat No. 4345053, U.S. Pat No. numbar average molecular weights and Mw/Mn which are proposed by each gazatta of 61-218632, JP.H3-72527A, JP.H3-47825.A, and JP.H8-231707A oan illustrate a polyoxyalkylene sories polymer with narrow molecular waight distribution in the 1.6 or lass amount of Polymer Division, It is not imited to in particular these.

A polyoxyalkylene series polymer which has the above-mentioned reactive silicon group may be used

ilone, and may be used together two or more sorts. 0000

propylene, 1-butene, and isobutylene, is polymerized as a main monomer, and] (2) After making diene unctional group into an end, and tend to control a molacular weight and can incraase tha number of sobutylene system polymar and a hydrogenation polybutadiane systam polymer tend to introduce a series, such as butadiene and isoprene, homopolymerize or carrying out copolymerization of the carbon-carbon unsaturated bonds other than an aromatic ring, and a polymer which makes the and functional groups, thay are prefarred, and a composite easa to espacially their isobutylene Said saturated hydrocarbon system polymer is a polymer which does not contain substantially above-mentioned olefinic compound, can obtain by a method of hydrogenating, but. Since an skeleton, (1). [whether an olefinic compound of the carbon numbers 1-6, such as ethylene. system polymer is praferred.

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All the monomeric units may be formed from an isobutylene unit, and an isobutylene system polymer. which is excellent in heat resistance, weatherability, endurance, and humidity interception nature. hat whose principal chain skeleton is a saturated hydrocarbon system polymer has the feature

originates in isobutylene from a field of rubber property 50% of the weight or more is preferred, what is contained 80% of the weight or more is morc preferred, and especially a thing contained 90 to 99% Although a copolymer with other monomers may be sufficient, what contains a repeating unit which of the weight is preferred.

As a synthetic method of a saturated hydrocarbon system polymer, although various polymerization methods are reported conventionally, especially living polymerization what is called of recent years many is developed, an iniphor polymerization (J. -- P.Kennedy et al.,) which was found out by cennedy and others in the case of a saturated hydrocarbon system polymer, espacially an

1843 pages, manufacturing aasily is possible, about 500 to 100,000 molecular weight can be olymerized in 1.5 or less molecular weight distribution, and it is known that various functional groups sobutylens system polymer J. Polymar Sol, and Polymer Chem. Ed. 1997, By using 15 volumes and

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can be introduced into a moleoular terminal.

As a process of a saturated hydrocarbon system polymer which has a reactive silicon group. For promotic, JPA-4965639, JPJ-10895828, JPS-295484A, Although it writes in each Description PLP, JPA-19799A, Patent Gazette No. 2879496, and JPJ-19799A, Patent Gazette No. 2879496, and JPJ-19799A, the state of section of the process of the proc 53882,A, it is not limited to in particular these.

t is a general formula in a saturated hydrocarbon system polymer which has the above-mentioned reactive silicon group (6).:

- Si(OR*) 3 (6)

formula is the same as the above) can be used as an ingredient. This (A7) ingredient has the feature Especially (A7) a saturated hydrocarbon system polymer that has a basis expressed with (R* in a weatherability, and humidity interception nature of a principal chain skeleton, and does not have generation of methanol accompanying a hydrolysis reaction of a reactive silicon group, and is a colymer whose stability of a hardened material, endurance, and creep resistance are still better. which is excellent in heat resistance based on a saturated hydrocarbon system polymer,

A saturated hydrooarbon system polymar which has the above-mentioned reactive silicon group may be used alone, and may be used together two or more sorts.

Especially in this invention, a chain can use what is an acrylic ester (meta) system copolymer as an ingredient (A6) in an organic polymer of the (A) ingredient.

such as methaorylamide: Alkenes; butadiane, such as vinyl ester; ethylane, such as vinyl acetate, vinyl be used. If it illustrates, sorylic sold (meta), methyl scrylate (meta), (Meta) Ethyl sorylate, scrylic scid (meta)-m-propyl, sorylic scid (meta) isopropyl, (Meta) Acrylic scid-m-butyl, isobutyl scrylate (meta). acid JIPA fluoromethylmathyl, acrylic acid (meta) 2-perfluoro methyl-2-perfluoro ethylmethyl, (Mata) 2-perfluoro decylethyl, and acrylic acid (meta) 2-perfluoro hexadecylethyl, etc. are mentioned. In tha aforementioned (meta) acrylic ester system copolymer, copolymerization of the following viryl system Silican context vinyl system monomers, such as vivytriethosysilance. A maleic anhyddide, Monoallyd sester and diskyl exect of maleic and and harbellyddes with the man and thoroallyd ester and diskyl exter of transic and and the harbellyde exter and diskyl exter of frameric and sold Monoallyd ester and diskyl exter of frameric and Monoallydes and the sesting the sesting of transic and Maleinide. Meta) Acrylic soid-tert-butyl, scrylic scid (meta)-n-pentyl, (Meta) Acrylic scid-n-hexyl, scrylic scid acid (meta), (Meta) Acrylic acid trifluoromathyl methyl, an acrylic acid (meta) 2-trifluoro methylethyl. monomers, such as KURORU styrene, styrene sulfonic acid, and its salt; Perfluoro ethylene, Fluoride Acrylic acid series (meta) monomers, such as acrylic acid 2-perfluoro haxylathyl, acrylic acid (meta) aforementioned (meta) acrylic ester system polymer, it is not limited but various kinds of things can (meta) oyolohexyl, (Meta) Acrylic acid-n-heptyl, acrylic acid (meta)-n-octyl, (Meta) Acrylic acid-2ethylhexyl, acrylic acid (meta) nonyl. (Meta) Decyl acrylate, acrylic acid (meta) dodecyl, acrylic acid (meta) phenyl, (Meta) Acrylic acid toluyl, acrylic acid (meta) benzyl, acrylic acid (meta)-2-methoxy ethyl, (Meta) Acrylic acid-3-methoxy butyl, acrylic acid (meta)-2-hydroxyethyl. (Meta) Acrylic acidbutylethyl, (Meta) Acrylic acid 2-parfluoro ethyl, acrylic acid (meta) parfluoro mathyl, (Meta) Acrylic aminoathyl, gamma-(methacryloyl oxypropyl) trimethoxysilane, an ethyleneoxide addition of acrylic Hexylmaleimide, oetylmaleimide, dodecylmaleimide, stearyl maleimide, Maleimide system monomers, such as phenylmaleimide and cyclohexylmaleimide, Acrylonitrile, Nitrile group content vinyl system content vinyl monomers, such as perfluoro propylene and vinylidene fluoride; Vinyltrimetoxysilane, monomers, such as a mathacrylonitrile; Acrylamide, Amide group content vinyl system monomers, monomers can also be carried out with an acrylic ester (meta) system monomer. When this vinyl 2-hydroxypropyl, acrylic soid (meta) stearyl, metaglycidyl acrylate (meta), acrylic soid (meta) 2propionate, vinyl pivalate, banzoic acid vinyl, and vinyl cinnamic acid, and propylene, Conjugated dienes, such as isoprene; VCM/PVC, a vinylidene chloride, an allyl chloride, allyl alcohol, etc. are mentioned. These may be used independently, and even if it carries out copolymerization of the Especially as an acrylic ester (mcta) system monomer which constitutes a main chain of the Meta) Acrylic acid 2-parfluoro ethylethyl, acrylic acid (mata) 2-perfluoro ethyl-2-perfluoro system monomer is illustrated, styrene, vinyitoluene, alpha-methylstyrene. Styrene system

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preferably especially, and is a polymer which consists of butyl acrysters still more preferably. A point that physical properties, such as hyporisoparty of compound, a for modeline of hardwald material, which properties, such as hyporisoparty of compound, a form developed material, single along the constitution of the properties of the constitution of the properties of preferred other monomers, copolymerization, and also that may carry out block copolymerization and sater monomer (meta) more preferably, is an acrylic polymer which consists of acrylic ester monomer monomers in that case. Acrylic soid (meta) expresses acrylic acid and/, or methacrylic acid with the acrylate is excellent in oil resistance. However, since it follows on increasing a ratio of butyl acrylate and the good oil resistance is spoiled, as for the ratio, for a use of which oil resistance is required, it ithough limitation is not carried out, a copolymer of ethyl acrylate / butyl scrylate / acrylic acid 2acrylate on the other hand in a use as which oil resistance, such as an automotive application, etc. are required is still more preferred. It can also transpose a part of ethyl scrylate to butyl acrylate in preferred to use acrylic acid 2-methoxy ethyl, acrylic acid 2-ethoxyethyl, etc. by which oxygen was introduced into an alkyl group of a side chain. However, since it is in a tendency for heat resistance to be inferior by introduction of an alkoxy group which has an ether bond in a side chain, when heat resistance is required, it is prefarred [the ratio] to make it to 40% or loss. It is possibla to obtain a preferred. It is an aprylic polymer which consists of aprylic ester monomer and a methacrylic-acidorder to raise that low-temperature characteristic, since it tends to be a little inferior to the lowcemperature characteristic (cold resistance), although a polymer mainly concerned with this othyl s preferred to carry out to 40% or less, and also it is more preferred to make it to 30% or less. In order to improve the low-temperature characteristic etc., without spoiling oil resistance, it is also polymer which changed the ratio and was suitable in consideration of physical properties needed, such as oil resistance, heat rasistance, and the low-temperature characteristic, according to a various application or the purpose demanded. For example, as an example which is excellent in properties balance, such as oil resistance, heat resistance, the low-temperature characteristic, nethoxy ethyl (it is 40-50/20-30/30-20 at a weight ratio) is mentioned. In this invention, it is hese desirable monomers are contained not less than 40% by a weight ratio in these desirable monomer from physical properties etc. and (meta) an acrylic acid series monomer of output is plurality, they are not cared about. Especially, a polymer which consists of a styrene system

above-mentioned expressive form.

distribution is narrow, and in order to obtain an exprile cetter system copolymer which has a cross-mingfundboatal group in misleauler definit terminals at a high rate (nets), it is preferred [it is a sorylic eates experien copolymer with low (meta) viscosity, and I to use a living-radical-polymerization compound, a peroxide, etc. as a polymerization initiator generally has a value of molecular weight especially as a synthetic method of an acrylic ester system copolymer (A6). However, it has the distribution as large as two or more, and viscosity becomes high. Therefore, molacular weight Meta) It is not limited but what is necessary is just to carry out by a publicly known method problem that a polymer obtained by the usual frea radical polymerizing method using an azo

Also in a "living-radical-polymerization method", an organic halogenated compound or a sulfonyl

manufacturing method of an acrylic cator system copolymer which in addition to the feature of the above-mentioned "living-radical-polymerization method" has halogen comparatively advantageous to nalide compound An initiator, An "stom-transfer-radical-polymerization method" which polymerizes an acrylic cster (meta) system monomer by making a transition metal complex into a catalyst. As a olumes. 5814 pages, etc. will be mentioned as this stom-transfer-radical-polymerization method in lexibility of a design of an initiator or a catalyst being large (meta), it is still more desirable. 117 functional group conversion reaction etc. at the end, and has a specific functional group from Matyjaszewski et al. and journal OBU American chemical society (J. Am.Chem.Soc.) 1995.

system copolymer which has a reactive silicon group (meta) may have low slongation as compared keletons, such as a polyoxyalkylene series polymer. Even if it uses an acrylic ester (meta) system A hardened material produced by hardening a hardenability constituent containing an acrylic ester vith a hardanability constituent containing an organic polymer which has other principal chain 01017

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As compared with an organic polymer which can improve notably the endurance of this (meta) acrylic renefar-radical-polymerization method", elongation may be insufficient and endurance may be bad. ester system copolymer by using on silicon a silicon containing functional group which has three or copolymer manufactured using the abova "living-radical-polymerization method" and an "atom-

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more hydrolytic bases as a reactive silicon group, and has other principal chain skeletons, an endurance improvement affact is large.

As a process of an acrylic ester system copolymer which has a reactive silicon group (meta), a

process using the free radical polymerizing method for having used a chain transfer agent for JP,H3used an atom-transfer-radioal-polymerization method for JP,H9-272714,A etc. is indicated, it is not 14068,B, JP,H4-55444,B, JP,H6-211922,A, etc. is indicated, for example. Although a process which imited to in particular these. it is a general formula in an acrylic ester system copolymer which has the above-mentioned reactive silicon group (meta) (6).:

- Si(OR*), (6)

accompanying a hydrolysis reaction of a reactive allicon group, and it is a polymer whose stability of a sepecially (A8) an acrylic ester system copolymer that has a basis expressed with (R4 in a formula is astar (meta) system copolymer of a principal chain skeleton in this (A8) ingredient. It has the feature the same as the above) (meta-) can be used as an ingredient. Heat resistance based on an acrylic which is excellent in weatherability and chemical resistance, and there is no generation of methanol hardened material, endurance, and creep resistance are still better.

component contained in a hardened material formed eventually increases especially when a reactive A reactive silicon group of the aforementioned (A8) ingredient may be in an end or an inside of an organic polymer chain, and may be in both. Since effective network chain density of a polymer silicon group is in an end of a polymer main chain, it is desirable from points, like a rubber-like

pardened material of high elongation becomes is easy to be obtained with high intensity.

rate, it is more desirable and especially an atom-transfer-radical-polymerization method is preferred. polymerization method is used, since molecular weight distribution is narrow, it is hypoviscosity, and from the ability to introduce a cross-linking functional group into molecular chain terminals at a high As a polymerization method of the aforementioned (A8) ingredient, when a living-radicalAn acrylic ester systam copolymer which has the above-mentioned reactive allicon group (meta) may be used alone, and may be used together two or more sorta.

together two or more sorts. Specifically, a polyoxyallynene series polymer which has a reactive silicon An organic polymer which has these reactive silloon groups may be used alone, and may be used

A manufacturing method of an organic polymer which blends a polyoxyalkylene series polymer which group, a saturated hydrocarbon systam polymer which has a reactive allicon group, an acrylic ester system copolymer which has a reactive silicon group (meta), and an organic polymer which blends two or more sorts chosen from a group, ** and others, can also be used.

has a reactive silicon group, and an acrylic ester system copolymer which has a reactive silicon group (meta). Although proposed by JP,59-122541.A, JP,83-112642.A, JP,H6-172531.A, JP,H11-116783.A etc., it is not limited to in particular these.

for an organic polymer which blends a polyoxyalkylene series polymer which has this reactive silicon group, and an acrylic ester system copolymer which has a reactive silicon group (meta) that stability t is known as compared with a case where a polyoxyalkylene serics polymer is independently used is bad. Then, the above-mentioned general formula (6) as a polyoxyalkylens series polymer component in the aforementioned organic polymer to blend: http://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_eije?atw_u=http%3A%2F%2Fwww4.ipdl... 2010/05/06

ss the above) is used, An organic polymer blended with an acrylic ester system copolymer (A6) which A polyoxyalkylene series polymer (A5) which has a basis expressed with (R^4 in a formula is the same has a reactive silicon group (meta) has outstanding stability, endurance, and creep resistance based on the (A5) ingredient, while outstanding weatherability and an adhesive property based on an

(A6) A desirable example of an acrylic ester (meta) system copolymer of an ingredient has a reactive silicon group, and a chain is a following general formula substantislly (14)::

ngredient (A6) ara shown.

the acrylic ester monomer unit which has an alkyl group of the carbon numbers 1-8 expressed with (a hydrogen atom or a methyl group, and R¹¹ show the alkyl group of the carbon numbers 1-8 among a

formula, as for R¹⁰) (mata-), and following general formula (15):

$$-CH_2-C$$
 (1

(-- the inside of a formula, and ${
m R}^{10}$ — the sbove -- the same -- ${
m R}^{12}$ shows a with a carbon numbars of ten or more alkyl group ---) --- to a copolymer which consists of an sorylic estar monomer unit which has a with a carbon numbers of ten or more expressed alkyl group (mata-). It is the method of

is R¹¹ of said general formula (14) — the carbon numbers 1–8 of a methyl group, an ethyl group, a olending and manufacturing a polyoxyalkylene series polymer which has a reactive silicon group.

propyl group, n-butyl group, t-butyl group, a 2-ethylhexyl group, etc. -- desirable -- 1-4 -- an alkyl group of 1-2 is raised still more preferably. An alkyl group of R¹¹ may be independent and may be nixed two or more sorts. as R¹² of said general formula (15) -- ten or more carbon numbers of a lauryl group, a tridecyl group, a cetyl group, a stearyl group, a behenyl group, etc. — usually — 10-30 — a long-chain alkyl group of 10-20 is raised preferably. Like a case of R¹¹, an alkyl group of R¹² may be independent and may be mixed two or more sorts.

Although a chain of a ** (meta) acrylic ester system copolymer consists of a monomeric unit of a

formula (14) and a formula (15) aubstantially, a "real target" here means that the sum total of a menomente unit of a formula (14) suprasses 50 % of the worker to tall of a monomente on the original (15) suprasses 50 % of the weight. The sum total of a monomente unit of a formula (14) and a formula (10) is 70 % of the weight or more preferably. nttp://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdli... 2010/05/06

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As for an abundance ratio of a monomeric unit of a formula (14), and a monomaric unit of a formula

15), 95:5-40:60 are preferred at a weight ratio, and 90:10-60:40 are still more preferred.

sthyl methacylate, A monomer containing amino groups, such as aminoethyl vinyl ether, a monomeric groups, such as glycidyl acrylate and glycidyl methacrylate, Diethylamino ethyl acrylate, diethylamino unit which originates in acrylonitrile, styrene, alpha-methylstyrene, alkyl vinyl ether, VCM/PVC, vinyl formula (15), For example, scrylic scid, such as acrylic acid and mathscrylic scid. Acrylamide, Amide As monomeric units other than a formula (14) which may be contained in this copolymer, and a groups, such as methacrylamide, N-methylolacrylamide, and N-methylolmethacrylamide, Epoxy acetate, vinyl propionate, ethylene, etc. in addition to this is raised.

as a reactive silicon group, and an acrylic ester system copolymer which has a reactive silicon group meta) is proposed by JP,H1-168764,A, JP,2000-186176,A, etc., It is not limited to in particular these. Although an organic polymer which blends a saturated hydrocarbon system system polymer which

which blends an acrylic ester system copolymer which has a reactant silloon functional group (meta) A method of polymerizing an acrylic ester (meta) system monomer elsewhere undar existence of an organio polymer which has a resctive silicon group as a manufacturing method of an organic polymer can be used. Although this manufacturing method is concretely indicated by cach gazette, such as JP,59-78223,4, JP,59-168014,A, JP,80-228516,A, and JP,60-228517,A, it is not limited to these. in this invention, silicate can be used as a (B) ingrodient. This silicate has the function to improve the stability of an organic polymer which is the (A) ingrodient of this invention, endurance, and creep

resistance.

(B) Silicate which is an ingredient is a general formula (16). Si(OR¹³) 4 (16)

the inside of a formula, and R¹³ — respectively — independent — a hydrogen atom or an alkyl group of the carbon numbers 1-20. They are an aryl group of the carbon numbers 6-20, and the univalent hydrocarbon group chosen from an aralkyl group of the carbon numbers 7-20. They are tetra alkoxysilane expressed or its partial hydrolysis condensate.

trimethoxysilane, dimethoxy diathoxysilane, methoxy triethoxysilane, Tetra alkoxysilane (tetraalkyl silicate), such as tatra n-propoxysilane, tetra i-propoxysilane, tetra n-butoxysilane, tetra i-As an example of silicate, for example A tetramethoxy silane, a tetraethoxysilane, Ethoxy

butoxysilane, and tetra t-butoxysilane, and those partial hydrolysis condensates are raised

Since a partial hydrolysis condensate of tetra alkoxysilane has an improvement effect of the stability of this invention, endurance, and creep resistance larger than tetra alkoxysilane, it is preferred.

A thing which was made to add and carry out partial hydrolysis of the water to tetra alkoxysilane by a usual method as a partial hydrolysis condensate of said tetra alkoxysilane for example, and was made to condense is raised. A commercial thing can be used for a partial hydrolysis condensate of an ORGANO silicate compound. As such a condensate, the methylsilicate 51, the ethyl silicate 40 are made in Col Coat), etc. are mentioned, for example. Silicate (B) shows an improvement effect of still better stability, endurance, and creep resistance by combining with an ingredient (A1) of this invention, an ingredient (A2), and the (A3) ingredient. By combining with an ingredient (A1) especially shows an improvement effect of good stability,

section, and also 1 – 5 weight section is preferred. (B) If loadings of an ingredient are less than this (B) As amount of ingredient usad, 0.1 - 10 weight section is preferred to (A) ingredient 100 weight endurance, and creep resistance.

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ange, an improvement effect of stability, andurance, and croep resistance may not be enough, and a sure rate may become slow if loadings of the (B) ingredient excead this range. The above-mentioned silicate may be used only by one kind, and may carry out two or more kind mixing usa In this invention, carboxylic acid tin salt can be used as a (O) ingredient. As compared with other sileral condensation catalysts, the stability of a hardened metarical obtained, entermore, and contensation or resistance can be improved by using this carboxylic acid the salt as a silend condensation catalyst of an organic polymer which is an ingredient (A1) of this invention.

imitation in particular does not have carboxyllo acid tin salt (C) used for this invention, and various kinds of compounds can be used for it.

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ncluding carbonyl carbons, and carboxylic acid of a hydrocarbon system of the carbon numbers 2-20 4s carboxylic acid which has an acid radical of carboxylic acid tin salt (C) here, a carboxylic acid group content compound of a hydrocarbon system of 2-40 is suitably used for a carbon number may be especially used suitably from a point of availability.

Enanthio acid, caprylic acid, 2-ethylhexanolo acid, palargonic acid, capric acid, Undecanoic acid, lauric When it illustrates concretely, acetic acid, propionic acid, butancic acid, a valeric acid, caproic acid, scid, Tauzuio acid, FIZETERIN acid, myristoleio acid, 2-hexadecenoic acid, 8-hexadecenoic acid, 7raccenic acid, gadoleic acid, Gondo Inn acid, a cetoleic acid, erucic acid, brassidic acid, selacholeic icid, Straight chain asturated fatty acid groups, such as RAKUSERU acid; Undacylenic acid, Lindor nonadecanoio soid, arachin soid, Bahenio soid, lignocerio soid, cerinio soid, montanio soid, melissio nexadecenoic aoid, palmitoleic acid, a petroselinic acid, Oleic acid, elaidic acid, ASUKUREPIN acid scid, KISHIMEN acid, RUMEKUEN acid, acrylic acid, methacrylic acid, angelic acid, Monocne oid, tridecylacid, myristic soid, pentadecyl soid, Pulmitic soid, heptadecylacid, stearic soid,

4.8.11.14-hexadeca totrsenoio acid, MOROKUCHI acid, steer RIDON acid, arachidonic acid, 8, 12 and 16, 19-docosatetraenoic acid, 4.8.12.15,18-eicosapentaenoic acid, clupanodonic acid, herring acid, taconic acid, etc. are mentioned. As aliphatic polycarboxylic acid, tricarboxylic acid, such as aconitic sold, Linolic sold, 10,12-cotadecadienoic sold, HIRAGO sold, alpha-eleostearic sold, beta-eleostearic Polyene unsaturated fatty soid, such as docosahexaenoic soid, 1-methylbutyric soid, Isobutyric soid, ss gorlic sciet, Acetoacatic acid, ethoxyscetic acid, Glyoxylic acid, glycolic acid, gluconic acid, sabinic acid, 2-hydroxytetradecancic acid, IPURORU acid, 2-hydroxyhaxadecancic acid, YARAPI Norian acid, mentioned. In addition, amino sold, such as an alanine, leucine, threenine, aspartic sold, glutamic sold. unsaturated fatty acid, such as crotonic acid, isocrotonic acid. and 10-undecenoic acid; Reno claidic and neo decanoic acid; PUROP! all acid, a tariric acid, Fatty scid with triple bonds, such as steer roll majvalic sold, steroulic sold, HIDONO carbyne acid, chaulmoogric sold, Alicyclic carvons solds, such 2-ethylbutanoio acid, isovalorio acid, tuberculosteario acid, Branch fatty acid, such as a pivalio acid sopropylbenzoia said, salicylia said, and toluia said; aromatic polycarboxylia saids, such as phthalia phlorosorylic soid, and chlorobenzoic sold, etc. are mentioned. As aliphatic dicarboxylic sold, adipic scid, azelaic acid, pimelic acid. Saturation dicarboxylic acid, such as SUPERIN acid, sebacio acid, unsaturated dicarboxylic acid, such as maleic acid, fumario acid, acetylene dicarboxylic acid, and soid, citrate, and isocitric soid, etc. are mentioned. As aromatic carboxylic soid, benzoic soid, 9anthracene carboxylic acid, Aromatic moncearboxylic acids, such as atrolactinic acid, anisic acid, acid, isophthalic acid, teraphthalic acid, carboxyphenyl acetic acid, and pyromellitic acid, etc. are acid, punicic acid, linolenic acid, 8 and 11, 14-eicosatrienoic acid, A 7,10,13-docosatrienoic acid, acid, a crepenynic acid, KISHIMENIN acid, and 7-hoxa crepe-de-China acid; Naphthenic acid, A Dxygenated fatty acid, such as recincleic acid, cam ROREN acid, licanic acid, ferron acid, and ethylmalonic acid, glutaric acid, oxalic acid, malonic acid, succinic acid, and oxydiacetic acid; perebronio acid, a halogenation object of monocarboxylic acid, such as chloracetic acid, 2ydroxyoctadecanoic acid, 18-hydroxyoctadecanoic acid, 9,10-dihydroxyoctadecanoic acid, uni-PERIN acid, AMBURETTORU acid, ARYURITTO acid, 2-hydroxycctadecencic acid, 12rginina, cystein, methionine, phanylalanine, tryptophan, and histidina, ia mentioned.

specially acquisition is easy, and is chaap and a point that compatibility with an ingredient (A1) is

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good to said carboxylic soid has 2-ethylhexanoic scid, octylic soid, nso decanoic scid, oleic soid, or preferred naphthenic scid.

(workability — bad). Therefore, as for the mething point of said carboxylio acid, it is preferred that it is 65 ** or less, it is more preferred that it is -50-50 **, and it is preferred that it is especially -40-35 when the metting point of said carboxylio acid is high (crystallinity is high), the metting point becomss high in a similar mannar, and it is hard to deal with carboxylio acid tin salt which has the acid radioal

iquefied and carboxylic acid tin salt which has the acid radical becomes a thing which has a high solid extended a constituent thinly, volatilization by heating may be large and catalyst ability of carboxylic numbers including carbon of a carbonyl group are 2-20, it is more preferred that it is 6-17, and it is nostly an ingredient which volatilizes easily with heating. Especially on conditions (thin layer) which carboxylio acid metal salt may fall [carboxylio acid tin salt which has the acid radical], including state or viscosity and which is hard to deal with it (workability --- bad). On the contrary, when a acid metal salt may fall greatly. Therefore, as for said carboxyllo acid, it is preferred that carbon when a carbon number of said carboxyllc acid is large (a molecular weight is large), it becomes carbon number of said carboxylic acid is small (a molecular weight is small), catalyst ability of preferred that it is especially 8-12.

carboxylic acid tin salt to dicarboxylic acid or monocarboxylic acid, and it is more preferred that it is It is preferred that it is the tín salt of a point of the ease (workability, viscosity) of dealing with it of the tin salt of monocarboxylic acid.

As said monocarboxylic acid tin salt, it is a general formula (17).: Sn(OCOR) 2 (17)

(The inside R of a formula is substitution or an unsubstituted hydrocarbon group, and may include a carbon carbon double bond.) Two RCOO-bases may be the same and may differ. A divalent Sn compound expressed or general formula (18):

It is the same as the above the inside R of a formula.) Two RCOO-bases may be the same and may differ. A tetravalent Sn compound expressed is preferred. A divalent Sn compound expressed with a general formula (17) from a point of hardenability and availability is more preferred. Sn(OCOR) 4 (18)

carboxylic acid tin salt (nec decanoic acid tin.) in which said carboxylic acid tin salt (C) is carboxylic position of a carboxyl group is the 3rd class carbon Pivalio-acid tin etc. are more preferred from a and aspecially carboxyllo acid tin salt whose carbon atom which adjoins a acid tin salt (2-ethylhexanoic acid tin etc.) and the 4th class carbon whose carbon of an alpha

cure rate being quick.

Especially in this invention, carbon of an alpha position of a carboxyl group uses carboxylic acid tin salt which is the 4th class carbon as an ingredient (C1) in carboxylic acid tin salt (O). carbonyl group is the 4th class carbon is preferred.

As carboxylic acid tin salt of an ingredient, it is a general formula (19).

Formula 51

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among the formula, R14, R15, and R16 are the independent substitution or unsubstituted univalent organic groups, respectively, and may contain the carboxyl group.) --- the chain fatty acid tin expressed or general formula (20): 0143

among the formula, an organic group univalent [substitution or unsubstituted] in \mathbb{R}^{17} and \mathbb{R}^{18} are substitution or unsubatituted divalent organic groups, and the carboxyl group may be included,

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rangeoticheky) — and general formula (21):

Formula 7)

$$\begin{bmatrix}
F(3) & 0 \\
F(3) & 0
\end{bmatrix}$$
(2.1)

sivalic acid, 2,2-dimethylbutancic acid, 2-ethyl-2-methylbutyric acid, 2,2-diethylbutancic acid, A 2,2-Jecanoic acid, BASA tic acid, Chain monocarboxylic acid, such as 2,2-dimathyl- 3-hydroxypropionic he carboxyl group.) — cyclic-fatty-acid tin containing the structure expressed is mentioned. If the carboxylic acid which has an acid radical of carboxylic acid tin salt (C1) is illustrated concretely, A among the formula, R¹⁹ is a substitution or unsubstituted trivalent organic group, and may contain ilmethylvaleric acid, a 2-cthyl-2-methylvaleric acid, a 2,2-diethylvaleric acid, 2,2-dimethylhexana soid. Dimethylmalonia soid, ethyl methylmalonic soid, diethylmalonic soid, 2,2-dimethyl ambor soid, scid, 2.2-diethylhexanoic acid, 2.2-dimethyloctanoic acid, 2-ethyl-2.5-dimethylhaxane acid, neo Chain dicarboxylic soid, such as 2.2-diethyl amber soid and 2.2-dimethylglutaric soid, Chain

stc. are mentioned. These can also be used although many compounds containing such a structure to -exabioyele [2.2.1]-5-hoptene-2-carboxylic acid, 1-adamantane carboxylic acid, Annular carboxylic nethylcyclohexane carboxylic acid, 2-methylbicyclo[2.2.1]-5- heptene-2-carboxylic acid, 2-methylscid, such as bicyclo[2.2.1] heptane— 1—carboxylic acid and bicyclo[2.2.2] octane— 1—carboxylic acid nethylcyclopentanecarboxylic acid, 1,2,2-trimethyl 1,3-cyclopentane dicarboxylic acid, 1ricarboxylic acid, such as 3-methyliso citrate and 4,4-dimethylaconitic acid, 1-

acquisition is easy, pivalic-acid tin, neo decanoic acid tin, BASA tic acid tin, 2,2-dimethyloctanoic monocarboxylate is more preferred and also chain tin monocarboxylate is more preferred. Since From a point that compatibility with an ingredient and workability are especially (A1) good, tin a natural product exist.

(O1) Also in an ingredient, although carboxylata of divalent tin and carboxylate of tatravalent tin are mentioned like a case of the above-mentioned (C) ingredient, carboxylate of a point of hardenability acid tin, especially 2-ethyl-2.5-dimathylhexane acid tin, etc. are preferred.

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and availability to divalant tin is more preferred.

preferred that it is 5–20, it is more preferred that it is 6–17, and it is preferred that it is especially 8– patalytic activity may fall if a carbon number increases more than this range, it is not desirable. It is 12. Since compatibility with an ingredient may fall that it is easy to become a solid state (A1) and As for a carbon number of carboxylic soid which has an soid radical of an ingradiant (C1), it is tot desirable from on the other hand, volatility, the increasa of a smell, and the thin layer hardenability of a hardenability constituent falling, if there are few carbon numbers.

2.2-dimethyloctanoic acid tin (divalent), 2-ethyl-2,5-dimethylhexane acid tin (divalent). Neo decanoic 4s an ingredient, from these points (C1) Neo decanoic acid tin (divalent), BASA tic acid tin (divalent) sold tin (tetravalence), BASA tic sold tin (tetravalence), 2.2-dimethyloctanoic sold tin (tetravalence) and especially 2-ethyl-2,5-dimethylhexane acid tin (tetravalence) are preferred.

(C) As amount of an ingredient and (C1) ingredient used, about 0.01–20 weight sections are preferred pure rate may become slow and a hardening reaction will become fully difficult to advance if loadings are less than this range, it is not desirable. On the other hand, if loadings exceed this range, working to ingredient (A1) 100 weight section, and also about 0.5-10 weight sections are preferred. Since a ifs becomes short too much, and workability may worsen, and it is not desirable from a point of

The (C) ingredient and (C1) an ingredient can be used combining two or more sorts besides using it 0152

On the other hand, only of the (G) ingredient and (C1) an ingredient, activity is low, and when moderate hardenability is not acquired, an amine compound can be added as a co-catalyst.

ethylhexyl) amine, Didecyl amine, dilauryl amine, JISECHIRU amine, distearyl amine, Aliphatic series octylamine, 2-ethylhexylamine. Nonyl amine, decyl amine, lauryl amine, pentadecyl amine, Aliphatic series primary amines, such as Sept Iles amine, stearylamine, and cyclohexylamine; Dimethylamine, Diethylamine, dipropyl amine, diisopropylamine, dibutyl amine, Diamylamine, dioctyl amine, di(2-As various amine compounds, although indicated to JP,H5-287187,A, for example, Specifically Methylamine, ethylamine, propylamine, isopropylamine. A butylamine, amyl amine, hexylamine, secondary amines, such as methylstearylamine, ethylstearylamine, and butylstearylamine;

riethylamine, Aliphatic saries tertiery amines, such as triamylamine, trihexyl amine, and trioctylamine; dimethylethylenediamine, Triethylenediamine, guanidine, diphenylguanidine, N.N.N. and N-tetramethyl Although morpholine, N-methylmorpholine, 2-ethyl-4-methylimidazole, 1, and 8-diazabicyclo (5, 4, 0) 1.3-butanediamino, N.N.N., N-tetramethyl ethylene diamine. 2,4.6-tris(dimethyl aminomethyl) phonol. propylamine, xylylena diamine, ethylenediamine, Hexamethylanediamine, dodecamethylenediamine, sniline, stearylaniline, a triphenylamine, N.N-dimethylaniline, dimethylbenzyl aniline, etc. rasch, As friary) amina, Aliphatic scries unsaturation amines, such as oleylamine; aromatic-amine; Laury diethylenetriamine, Tristhylenetetramine, tetraethylenepentamine, benzylamine. Diethylamino other amines, monoethanolamine, diethanolamine, Triathanolamine, dimethylamino ethanol, undecene 7 (DBU) etc. are mentioned, it is not limited to these.

badings of an amine compound exceed 20 weight sections, pot life may become short too much and weight sections, and a hardening reaction becomes fully difficult to advance. On the other hand, if preferred. A cure rate may become it slow that loadings of an amine compound are less than 0.01 As for loadings of said amine compound, about 0.01-20 weight sections are preferred to organic polymer 100 weight section of an ingredient (A1), and also its 0.1 to 5 weight section is more

catalyst is used as a silanol condensation catalyst of an organic polymer which has a reactive silicon In this invention, an organic tin catalyst can be used as a (D) ingredient. When this organic tin is not preferred from a point of workability.

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group, as compared with other silanel condensation catalysts, a hardenability constituent with high

stalytic activity, and good depths hardenability and an adhasive proparty is obtained. However, according to an addition of this organic tin catalyst, the stability of a hardened material of a

pardenability constituent obtained, endurance, and creep resistance fall

activity is high, and depths hardenability and an adhesive property are good, and the stability of a A hardenability constituent which added an organic tin catalyst of the (D) ingradient by using an organic polymer which is an ingredient (A1) of this invention as a polymar component. Catalytic nardened material obtained, endurance, and creep resistance can be maintained highly. n using adhesives or a scaling material which, on the other hand, contains an organic polymer which nowever, if this carboxylic acid tin salt is used as a curing catalyst, when it will be alike around a carboxylic soid tin salt of the aforementioned (C) ingredient as a curing catalyst in many cases. as a reactive silicon group as the main ingredients for a use which needs endurance, it uses

portion, and may remain on conditions of heat and high humidity especially with un-hardening. On the combined, the hardenability of a thin layar part can be improved notably, maintaining the stability of a other hand, if said organic tin catalyst (D) is used as a curing catalyst, as mentioned above, stability satalyst of an organic polymer and the (D) ingredient which is an ingredient (A1) of this invention is nasonry joint and a scaling material will remain by a thin layer, it is hard to harden that thin layer and endurance will fall, but the hardenability of a thin layer part is good. Then, if an organic tin pardened material obtained, and endurance highly.

depending on an addition of an organic tin catalyst of the (D) ingredient, stability and endurance may fall a little. Then, it is more preferred to decrease the quantity of an addition of the (D) ingredient to However, even if it combines with an organic polymer which is an ingredient (A1) of this invention, hardenability, depths hardenability, an adheaive property, and thin layer hardenability are acquired an organic tin catalyst of the (D) ingredient as a curing catalyst. such an extent that carboxylic acid tin salt of the (C) ingredient is used together and sufficient

As an example of said organic tin catalyst (D), they are dially! tin carboxylate, dialky! tin oxide, and a

Sn(OZ) 4-g or [Q2Sn(OZ)] 2O (22) reneral formula (22).

(Z expresses among a formula an organic group which has a functional group with which Q can form a coordinate bond in an inside of a univalent hydrocarbon group of the carbon numbers 1-20, or self for diphanyldimathoxysilane, and phenyltrimethoxysilana. Since activity as a silanol condensation catalyst is high, chelete compound shown by a general formula (22) a univalent hydrocarbon group of the carbon numbers 1-20 to Sn.) g is 0, 1, 2, or 3. A compound etc. liscetate, it is usable as a (D) ingredient also in a reactant with a low molecule silicon compound which are shown are shown. Tetravalent tin compounds, such as diality! tin oxide and diality! tin which has hydrolytic sillcon groups, such as a tetracthoxysilane, methyl triathoxysilana, also in these, i.e., dibutyl tin bisacetylacatonate etc., are more preferred

malate, Dibutyl tin dibutyl maleate, dibutyl tin diisooctyl malate. Dibutyl tin ditridecyl malate, dibutyl tin diberazyl malate, dibutyltin maleate, dioctyl tin discearate, dioctyl tin distaerate, dioctyl tin distaerate. As an example of said dialkyl tin carboxylate. For example, dibutyltin dilaurate, dibutyltin diacetate, a dibutyl tin diethylhexano rate, Dibutyl tin JIOKUTETO, dibutyl tin dimethylmalate, dibutyl tin diethyl dioctyl tin diethyl malate, dioctyl tin diisooctyl malate, etc. are mentioned

0161]

As an example of said dialkyl tin oxide, dibutyl tin oxide, dioctyl tin oxide, a mixture of dibutyl tin oxide and phthalic ester, etc. are mentioned.

said chelate compound is illustrated concretely,

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Although ** is mentioned, it is not limited to these. In these, its catalytic activity is high, and it is low oost, and since dibutyl tin bisacetylacetonate is easy to receive, it is the most preferred if said tin alcoholates are illustrated concretely, [0166]

[0167]

Formula 9]

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exceed this range, working life becomes short too much and workability may worsen. (D) The stability of a hardened material which will be obtained if an improvement effect of hardenability, depths ngredient 0.01 - 10 weight section to ingredient 100 weight section, and also it is more preferred to When loadings of an ingredient are less than this range, a cure rate may become slow, when loadings hardenability, an adhestve property, and thin layor hardenability may not be enough if loadings of an ingredient are less than this range, and loadings exceed this range, endurance, and creep resistance As amount of [in case used of using the (D) ingredient and the (C) ingredient together as a ouring consider it as (C) ingredient: 1 - 10 weight section and (D) ingredient: 0.02 - 5 weight section. (C) catalyst], (A1) It is preferred to consider it as (C) ingredient 0.5 - 20 weight section and (D)

The (D) ingredient can be used combining two or more sorts besides using it alone.

condensation catalyst of an organic polymer which is an ingredient (A1) of this invention. A non-tin In this invention, a non-tin catalyst can be used as a (E) ingradiant. This non-tin catalyst has a function which improvas the stability of a hardoned material obtained, endurance, and creep catalyst which is the (E) ingredient is an eco-friendly curing catalyst with high social needs. resistance as compared with other silanol condensation catalysts, when it uses as a silanol

is no restriction in perticular, an organic metallic compound containing anthoxylic acid curboxylic acid for the thin unboyslic acid metallic acid such that organic acid outloans acid, also acid, and 38 fellows, and AR group metal, etc. are illustrated. As a non-tin catalyst which is the (E) ingredient which can be used for this invention, although there

he various above-mentioned carboxylic acid which has an acid radical of carboxylic acid tin salt

that it is especially 8-12. A point to dicarboxylic acid or monocarboxylic acid of the ease (workability, viscostey) of dealing with it of carboxylic acid is preferred, and monocarboxylic sold is more proferred, arroxylic acid in care in sold is more proferred acroxylic acid from channic and in which said nated outside acid (2-ethylharsamoio acid etc.) and the 4th class carbox whose carbox of an alpha position of a carboxy group is the 3rd acid etc.) and the 4th class carbox whose carbox of an alpha position of a carboxy group is the 3rd As for said carboxylic soid, it is preferred like carboxylic acid tin salt (G) that carbon numbers including carbon of a carbonyl group are 2-20, it is more preferred that it is 6-17, and it is preferred to the context of the conte

(C4He) 2Sn (O ()) 2

[(C4H9) 2Sn]20 CH3

[(C4H₉) 2\$n] 20

(C4Hg) 2Sn (0 \(\))2

(G4H₉) ₂Sn (0C₁₂H₂₅) ₂ (C4Hg) 2Sn (0CgH₁₇) 2

(C4Hg) 2Sn (OC3H7) 2 (C4H₉) ₂Sn (0C₄H₉) ₂

Sn (0CH₃) 4

(C4Hg) 2Sn (0CH3) 2 C4HgSn (OCH3) 3

(C4H₉) 3SnOCH₃

(C₈H₁₇)₂Sn (DCH₃)₂

mentioned carboxylic acid can be used conveniently.

Darboxyllo acid potassium, carboxylic acid barium, carboxylic acid manganase, carboxylic acid nickel, in oarboxylio acid matal salt other than said carboxylio acid tin salt, carboxylio acid bismuth. Oarboxylio acid caloium, carboxylio acid vanadium, carboxylio acid iron, carboxylio acid titanium.

Although ≯* is mentioned, it is not limited to these, in these, a dislkyl tin JIARUKOKI side is preferred. Especially the dibutyl tin JIMETOKI side is low cost, and since it is easy to recalive, it is

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(D) As amount of ingredient used, about 0.01-20 weight sections are preferred to ingredient (A1) 100 weight section, and also about 0.1-10 weight sections are preferrad. Sinca a cure rate may become alow and a hardening reaction will become fully difficult to advance if loadings are less than this range, it is not desirable. On the other hand, if loadings exceed this range, working life becomes short too much, and workability may worsen, and it is not desirable from a point of storage stability.

which is the (C) ingredient as carboxylic acid can be illustrated.

class carbon A pivalic acid etc. are more preferred from a cure rate being quick, and especially carboxylic acid whose carbon atom which adjoins a carbonyl group is the 4th class carbon is Especially as carboxyllo acid. 2-ethylhexanoic acid, neo docanoic acid, BASA tic acid, 2.2-dimethyloctanoic acid, and 2-ethyl-2,5-dimethylhexane acid are preferred from a point of availability.

As carboxylic acid metal salt other than said carboxylic acid tin salt, metal salt of the various above-

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schoxylio acid cobalt, a carboxylio acid zirconium, and carboxylic acid cerium, From a high point, the acid barkum, carboxylio acid mangarasan, and o carboxylio acid zirconium are more preferred. Carboxylio acid barkum, entroxylio acid calcium, carboxylio acid varadium, carboxylio acid inconsistente acid terrorium as a carboxylio acid successiva acid terrorium as a carboxylio acid carb ctivity of a catalyst is preferred and Carboxylio soid bismuth, carboxylio soid calcium, Carboxylio icid vanadium, carboxylic acid iron, carboxylic acid titanium, carboxylic acid potassium, Carboxylic bismuth, carboxylio acid iron, and carboxylio acid titanium are especially the most preferred. Carboxylic acid bismuth, carboxylic acid caloium, carboxylic acid vanadium, Carboxylic acid titanium, parboxylio acid potassium, carboxylic acid barium, carboxylic acid manganese, carboxylic acid nickel coloring of a hardenability constituent obtained, and a point that the heat resistance of a hardened carboxylio acid cobalt, and a carboxylio acid ziroonium, it is more desirable from a point with little

material and weatherability which are obtained are high, and carboxylic acid bismuth, carboxylic acid calcium, carboxylic acid calcium, carboxylic acid barium, and a carboxylic acid barium, and a carboxylic soid zirconium are still more preferred. It is more preferred that it is matal salt of a point of the case (workability, viacosity) of dealing with it of orthoxylo sold metal salt to monocarboxylo sold. [0]81]

As said monocarboxylic acid matal aalt, it is general formula (23) - (35).:

3(OCOR) 3 (23)

3a(OCOR) 2 (24) /(0COR) 3 (25)

=e(OCOR) 2 (26)

=e(OCOR) 3 (27) T(OCOR) 4 (28)

(OCOR) (29)

Mn(OCOR) 2 (31) 3a(OCOR) 2 (30)

nickel(OCOR) 2 (32) 20(OCOR), (33)

I/(0) (0COR), (34)

Ce(OCOR) , (35)

(The inaide R of a formula is substitution or an unsubstituted hydrocarbon group, and may include a oarbon carbon double bond.) Two ROOO-bascs may be the same and may differ. Carboxylio acid metal salt expressed is preferred.

As a carboxylic acid group of carboxylic acid metal salt other than said carboxylic acid tin salt, an acid radical of various carboxylic acid tin salt illustrated as the aforementloned (C) ingredient can be mentioned. 0182

ethylihexanole acid vanadium (trivalent), 2-ethylhexanole acid calolum (divalent), 2-ethylhexanole acid potassium (univalent), 2-ethylhexanole acid barium (divalent), 2-ethylhexanole acid manganose decanoic acid titanium (tetravalence), Neo decanoic acid vanadium (trivalent), neo decanoic acid calcium (divalent), Neo dacanoic acid potassium (univalent), neo decanoic acid barium (divalent), a sthylhexanoio acid ziroonium (tetravalence), 2-athylhexanoic acid ccrium (trivalent), neo decanoic From a viewpoint of the availability of a raw material, and compatibility. as an example of desirable sold bismuth (trivalent), Neo decanoic sold fron (divalent), neo decanoic sold fron (trivalent), neo neo dacanoio acid zirconium (tetravalence). Nao decanoio acid cerium (trivalent), bismuth oleate oarboxylic acid metal salt, 2-ethylhexanoic acid bismuth (trivalent), 2-ethylhexanolc acid iron (divalent), 2-ethylhexanoic acid iron (trivalent), 2-cthylhexanoic acid ittanium (totravalence), 2-(divalent), 2-ethylhexanoic acid nickel (divalent), 2-ethylhexanoic acid cobalt (divalent), 2ttp://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdli... 2010/05/06

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trivalent), oleio acid iron (divalent), oleio acid iron (trivalent), oleio acid titanium (tatravalence), oleio acid vanadium (trivalent). Oleio acid calcium (divalent), oleio acid potassium (univalent), oleio acid tetravalence), Naphthenic sold vanadium (trivalent), caloium naphthenate (divalent), naphthenic sold parium (divalent), Manganese oleate (divalent), oleio acid nickel (divalent), oleio acid cobalt (divalent) trivalent), Naphthenic acid iron (divalent), naphthenic acid iron (trivalent), naphthenic acid titanium) An olaic acid zirconium (tatravalenca), olcic acid cerium (trivalent), naphthenic acid bismuth ootassium (univalent), Naphthenic acid barium (divalent), manganese naphthenate (divalent), naphthenie seid niekel (divalent), cobalt naphthenate (divalent), a naphthenie seid zirconium (tetravalence), naphthenic acid cerium (trivalent), etc. are mentioned.

2-ethylhexanoic acid bismuth (trivalent) from a viewpoint of catalytic activity, 2-ethylhexanoic acid ron (divalent), 2-ethylhexanoic acid iron (trivalent), 2-ethylhexanoic acid titanium (tetravalence). Noo acid iron (trivalent), oleic acid titanium (tetravalence), naphthenic acid bismuth (trivalent), Naphthenic decanoic acid bismuth (trivalent), neo decanoic acid iron (divalent), neo decanoic acid iron (trivalent). Neo decanoic acid titanium (tetravalence), bismuth oleate (trivalent), oleic acid Iron (divalent), Oleic acid iron (divalent), naphthenic acid iron (trivalent), and naphthenic acid thanium (tetravalence) are more preferred, and 2-ethylhexanoic acid iron (trivalent), neo decanoic acid iron (trivalent), and especially naphthanic acid iron (trivalent) are preferred.

Z-ethylhexanoic acid bismuth (trivalent) from a viewpoint of coloring, 2-ethylhexanoic acid titanium (tetravalenca), 2-ethylhexanoic acid calcium (divalent), 2-ethylhexanoic acid potassium (univalent), 2decanoic acid zirconium (tetravalence). Bismuth oleate (trivalent), oleic acid titanium (tetravalence). ethylhexanoio acid banum (divalent), 2-ethylhexanoic acid zirconium (tetravalence), Neo decanoio oleic said calcium (divalont). Oleic acid potassium (univalent), oleic scid barium (divalent), an oleic scid zirconium (tetravalence). Naphthenic scid bismuth (trivalent), naphthenic acid titanium acid bismuth (trivalent), neo decanoio acid titanium (tetravalenoe), Neo decanoio soid caloium (divalent), neo decanoio soid potassium (univalent), Neo decanoio acid barium (divalent), a neo

barium (divalent), and a naphthenic acid zirconium (tetravalence) are more preferred. oluenesulfonio acid, styrene sulfonic soid, etc. are raised as organic sulfonic acid

(tetravalence), calcium naphthenate (divalent), naphthenic acid potassium (univalent), naphthenic acid

Alkyl acid phosphate is -0-P (=0) OH. It is phosphoric ester containing a portion and alkyl acid phosphate as shown below is contained. An organic acid nature phosphoric ester compound is preferred in respect of compatibility and curing ostalyst activity. 0187

An organic soid natura phosphoric ester compound is exprassed with h(R²⁰-O)-P(=O) (-OH) 3-H (in

the inside h of a formula, 1 or 2, and R²⁰ show an organio residue). Below, it illustrates concretely.

0H), and ,(C₈H₁₇O)-P (=0) (-OH), (C₈H₁₇O)-P(=0) (-OH)₂. (C₁₀H₂₁O)₂-P (=0) (-OH), (C₁₀H₂₁O)and ,(C,H,O)-P (=0) (-OH), (C,H,O)-P(=0) (-OH), and ,(C,H,O)-P (=0) (-OH), (C,H,O)-P(=0) (- $P(=0) \; (-0H) \; {}_{2}, \; (G_{13}H_{27}O) \; {}_{2} - P \; (=0) \; (-0H), \; (G_{13}H_{27}O) - P(=0) \; (-0H) \; {}_{2} \; \text{and} \; {}_{2}(G_{16}H_{33}O) - P \; (=0) \; (-0H), \; (-0$ OH) (CHOH) O]-P(=0) (-OH) 2, Although ((CH2 OH) (CHOH) C2H4O) 2-P (=0) (-OH) and ((CH2 OH) C₈H₁₆O)-P (=0) (-OH). (HO-C₈H₁₆O)-P(=O) (-OH) ₂. ((CH₂ OH) (CHOH) O) ₂-P (=O) (-OH). ((CH₂ $(CH_3O)_2 - P (=0) (-OH), (CH_3O) - P (=0) (-OH)_2, (C_2H_5O)_2 - P (=0) (-OH), (C_2H_5O) - P (=0) (-OH)_2$ $(c_{16}H_{33}O)-P(=0)\ (-OH)\ _{2},\ (HO-C_{6}H_{12}O)\ _{2}-P\ (=0)\ (-OH),\ (HO-C_{6}H_{12}O)-P(=O)\ (-OH)\ _{2},\ (HO-C_{12}G)$

CHOH) C2H401-P(=0) (-OH) 2 etc. are raised, it is not limited to the above-mentioned illustration

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compound can be added as a co-catalyst.

As various amine compounds, the indicated various above-mentionad amine compounds can be used

As for loadings of said amine compound, about 0.01-20 weight sections are preferrad to organic as a co-catalyst of carboxylic acid tin salt (C).

badings of an amine compound exceed 20 weight sections, pot life may become short too much and weight sections, and a hardening reaction becomes fully difficult to advance. On the other hand, if polymer 100 weight section of an ingredient (A1), and also its 0.1 to 5 weight section is more preferred. A cure rato may become it slow that loadings of an amine compound are less than 0.01 is not preferred from a point of workability. As a metal system compound of non-tin, besides carboxylic acid metal salt other than said carboxylic compound, an organic boron compound, etc. are preferred from a point of activity, it is not limited to acid tin salt, An organic metallic compound containing 3B fellows and 4A group metal is raised, and although a transate organic compound, an organoaluminium compound, an organic zirconium

tetra (2-ethylhexyl titanate). Chalate compound, such as titanium chelata, such as titanium alkoxides. such as triethanolamine titanate, titanium tetra acetylacetonato, titanium ethylacetoacetate, octylane As said titanate organic compound, tetraisopropyl titanate, Tetrabuthyl titanate, tetramethyl titanata, glycolate, and titanium lactate, etc. are raised.

4s said organoaluminium compound, aluminum isopropylate. Aluminum alkoxides, such as mono sec-

outoxy aluminum disopropylate and aluminum sec-butyrate. Aluminum chelate, such as aluminum tris scetylacetonato, aluminumtrisethylacetoscetate, and diisopropoxy aluminum ethylacetoacetate, is

As said zirconium compound, zirconium tetra isopropanal POKISAIDO, Zirconium alkoxides, such as a zirconium tetra-n PUROPI rate and zirconium normal butyrate. Zirconium chelate, such as zirconium tetra acetylacetonato, zirconium monoacetyl acetonate, zirconium bisacetylacetonate, zirconium acetylacetonato bis-ethylacetoacetate, and zirconium acetate, is raised.

ooncomitant usa with said amine compound or an alkyl-acid-phosphate compound aince it is possible to improve activity, and more desirable in a viewpoint of adjustmant of working life in hardenability organoaluminium oompound, an organic zirconium compound, an organic boron compound, etc., It is desirable in a viewpoint which can reduce the amount of catalyat usad especially according to Although **** concomitant use is also possible so, these titanate organic compounds, an

E) As amount of ingredient used, about 0.01-20 weight sections are proferred to ingredient (A1) 100 veight section, and also about 0.5-10 weight sections are preferred. Since a cure rate may become slow and a hardoning reaction will become fully difficult to advance if loadings are less than this and ordinary temperature in an elevated temperature.

ange, it is not desirable. On the other hand, if loadings exceed this range, working life becomes short soo much, and workability may worsen, and it is not desirable from a point of storage stability.

he (E) ingredient can be used combining two or more sorts besides using it alone.

n this invention, a minute hollow body can be used as a (F) ingredient. While improving the workability ******* thixotropy) of a constituent notably as indicated to JP.H11-35923,A or JP.H11-310772,A f this minute hollow body is used, it is known that a weight saving of a constituent and low-cost-

zing are possible. However, it is known that the atability of a hardened material of a hardenability constituent and endurance which are obtained will fall according to an addition of this minuta hollow

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The hardenability constituent which added a minute hollow body of the (F) ingredient by using an

s very small hollow body (hanceforth a balloon) which is the (F) ingredlent of this invention is a hollow body by which a diameter was preferably constituted from material of minerals of 500 micrometers or less or quality of organicity 1 mm or less as indicated, for example on "state-of-the-art art of a tunctional filler." (CMC). (F) An ingredient in particular is not limited but it is [ingredient.] usable in various kinds of publicly known balloons. organic polymor which is an ingredient (A1) of this invention sa a polymer component can maintain highly the stability of a hardened material and enduranca which are obtained, improving workability

preferred that it is $0.03-0.7~\mathrm{g/cm}^3$, and it is preferred that it is especially $0.1-0.5~\mathrm{g/cm}^3$. If tensile strongth of a hardened material may fall if average particle density is less than this rango, and average particle density exceeds this range on the other hand, a workability improvement effect may As for average particle density of a balloon, it is preferred that it is $0.01-1.0~\mathrm{g/cm^3}$, it is more 0203

An inorganic system balloon is more preferred than a point of stability and andurance to an organio

ayatem balloon. 0205

etc. on a non-silicie acid system balloon. As an example of these inorganic system balloons, as a milt balloon, a win light by JJICHI Chemicals, As a SANKI light by Sanki Engineering Co., Ltd., and glass ZIRCONIUM SPHEES made from ZIRCOA, KUREKASU fair made from Kureha Chemicals and product CORNING, As GLASS BUBBLES made from 3M, FUJIBA lune made from Fuji SHIRISHIA Chemicals, and a silica balloon, as Q-CEL by Asahi Glass Co., Ltd., SAIRISHIA made from Fuji SHIRISHIA Chemicals, and fty ash balloons, CEROSPHERES made from PFAMARKETING, FILLITE made from FILLITE U.S.A. As an alumina balloon, as BW by Showa Denko K.K., and a zirconia balloon HOLLOW balloons, KARUN by Nippon Sheet Glass Co., Ltd., The Sumitomo 3M cell star Z-28, MICRO BALLOON made from EMERSON&CUMING, CELAMIC GLASSMODULES made from PITTSBURGE balloon, fly ash balloons, etc. can illustrate an alumina balloon, a zirconia balloon, a carbon balloon. As aaid inorganio system balloon, oan illustrate a ailicio soid system balloon and a non-silicio soid aystem balloon, and on a silicio soid system balloon. A milt balloon, perite, glass balloons, a silica

here is made to foam, after blending a thing containing a foaming agent, and is good also as a balloon. oan illustrate a saran balloon, a polystyrene balloon, a polymathacrylate balloon, a polyvinyl alcohol balloon, and a styrene acrylic balloon at a tharmoplastic balloon. A balloon of thermoplastics which system balloon, On a thermosatting balloon, a phenol balloon, an epoxy balloon, and a urea balloon A balloon of thermosetting resin and a balloon of thermoplastics can be illustrated as said organic constructed the bridge can also be used. A balloon after foaming may be sufficient, and a balloon car boss fair made from GENERAL TECHNOLOGIES are marketed as a carbon balloon.

EMERSON&CUMING, As a ures balloon, ECCOSPHERES VF-0 made from EMERSON&CUMING, As a saran balloon, SARAN MICROSPHERES made from DOW CHEMICAL. Expandel made from Japanese Co., Ltd. (P) are marketed by EXPANDABLE POLYSTYRENE BEADS made from BASF WYANDOTE, Filament, the Matsumoto Yushi-Seiyaku Matsumoto microsphere, As a polystyrene balloon, DYLITE EXPANDABLE POLYSTYRENE made from ARCO POLYMERS, SX863 by Japan Synthetic Rubber As an example of these organic system balloons, as a phenol balloon, Union Carbide UCAR and PHENOLIC MICROBALLOONS, As an epoxy balloon, ECCOSPHERES made from and constructed type styrene acrylic soid balloon of a bridge. The above-mentioned balloon may be used alona, and two or more kinds may be mixed and it may be used. The surface of these balloons Fatty acid, fatty acid ester, rosin, What was processed in order to improve dispersibility and the workability of a compound by rosin acid lignin, a silane coupling ngant, titanium coupling agent, aluminum cup ring agent, a polypropylane glycol, cto. can be usad

Without spoiling pliability, and clongation and intensity among physical properties at the time of

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stiffaning a compound, these balloons are used in order to carry out a weight aaving end to cut down

the cont.

To the amount of balloon used, about 0.1–60 weight socions are preferred to ingredient (A1) 100 (as for the amount of balloon used, about 0.1–60 weight socions are preferred. There is a volvability preparement effect may not be enough if loadings are less than this image, and badding secesat this preparement effect may not be enough if loadings are less than this image, and badding secesat this

ange, tensile strength of a hardened meterial may fall or stability and endurance may worsen.

this (G) ingredient : - Si(OR⁴) , (6) While having stability, endurance, and creep resistance outstanding by adding to sn organic polymer

the constitution of the constitution of the constitution of the constitution of the constitution of the constitution in which or a cutaturing density property is attent. To a restrict allow members of this (O) inspired, Em of it and constitution in which or cutaturing density property is shown to a constitution of the CM inspired to the constitution of the c

condensation hardwaing, but become lead if with a constitution's with nigh sarroy.

(IQ.11)

(IQ.14)

(ii) An ingredient is a compound which has a reactive allicon group aspressed with a general formula (iii) And an amino group. As an example of a reactive allicon group aspressed with a general formula (iv) theritory self require, a methyldic schooly self-group, a dimethylathrooy sluly group, an ethyldedbrooy self-group, attrisopropous july group, a methyldic seprepacy sluly group, and the inschipededbroot.

cure rate in storage order, it is preferred.

is chiedate all propertions, a methylot despensable and emphasimons by group, an uncontentional his propertions of the chiedate and propertions of the chiedate and propertions of the chiedate and an event of the chiedate and a viewpoint of a cure rate to a triedutory ally group is the the chiedate and the chiedate and the chiedate and the chiedate and a viewpoint of a cure rate to a triedutory ally group is the

most perderred.

Ran 1820 of an ingredient, (G) gamma-aminopropyl thethoxysilano, gamma-aminopropyl,

inclineacopous distant gamme arminocopy in theidelical considerate amenda del materiora bette interest amenda materiora bette del materiora de

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JP.2006-518287.A [] 34/59.A—3; prosylybthyderodiamine, Amino group content Silang, such as bistrictiony sily prosylybamine and gammer J2-(2-aminochty) aminocutyly aminocropy bridhocysiam, can be meritioned A destured gammer J2-(2-aminochty) aminocutyly aminocropy bridhocysiam, can be meritioned A destured

earlynative and a condensation reaction thing of the aboverment/loned silens compound can also use the aboverment/loned silens compound as a (3) tregets (1014).

[0214]

For the (3) regets entranced silens compound is a (3) the 30 to 10 to copies to 100 copies of organic polymers the (3) represent the soft or the (4) signedient it is profited to use it in 1-4 copies specially. This aboverment/loned (0) or the (4.5) tree (4.5) the (4.5) the soft organic polymers.

or or to kny lagradient. It is provered to use it in 1-a copies experiment, instance inserious out ingredient may be used only by one field, and margor out known or order kind mixing uses. [Ox15]

(A)). A chalcebrare may be added when using as a 1 ligad door contributor to constituent which constitues of an ingredient and a (0) ingredient. Expending as a 1 ligad door contributor to constituent which constitues dead of companied see the used. Since (that at elements in highway depending the allocation is dead of companied see the used. Since (that at elements in highway companied and a since the contribution of the companied between the companied and are independent and proper operation and the companied between the contribution of the companied of the contribution of the companied of the contribution of the unique of the unique of the unique of the contribution of the contribution of the unique
[0216] At this invention, it is a general formule as e (H) ingredient (8). :

 $-\sin^2_4(OCH_3)$, $_*(OCR^3)$, $_{3-d-a}(8)$ (Amone a formula of R^3 is the creating or energy of monovelence of the carbon

(Among a formula, 8)? If the opergin closured of encountering or the expension multitlers 1–20 independently respectively. If it is the opergin closured of encountering or grain of encountering the expension of the countering of encountering or encounter

 $- Si(OR^3)_3$ (6) If it is recuperated beforehend, a hardenability constituent added to an organic polymer which has e

basis expressed with (IV² in a formule is the same as the above), (If An exter exchange reaction between a method by thost for this confident and reactive allocate group of the (AA) ingredient between a method by the troop of the confident and executed ingredient. In the control to the confidence is to a reactive allocate group of the (AA) ingredient in the confidence is confidented as a reactive allocate group of the (AA) ingredient is hardwalling to confidented between the confidence is not execute the confidence, and or expective that controlling confidence, and or expression of the confidence, and or expression to the confidence and or expression to the confide

Designed exercive-their condition or deal shorteningly conditions that in consists of an improvement and the business exercive-their condition catalogues and consistence of a personative continuous Sicon it changes with oxidation of a reasonativities of the Old segretarized by the Valley resident controlly cledded, but as a trenoustatification outside, when it includes in regime for eatility at OLG sopy—about these cookies of IT system catalogues in a system, in a low impropance according to 10.00 or part, there cookies of IT system catalogues in a system, in a low impropance according to 10.00 or shall these cookies of IT system catalogues in a system, in a low in supportant expensively convented or more than a day recognized conceptuated companiety on waske or more spreadering and it is preferred that more than a day resopretate characteristic for rolls is the 30 or high

(10.18) Although it is unable as a many liquid [such as 1 liquid type and a two-component type. I type constituent, when it is considered as 1 liquid type, aims said hardenshiltly constituent which constitued of an improduct and it. (Ai) impredient has a remarkable change of a cure rate especially by cure of health, it is preferred.

temperature service.

(H) An ingredient is a compound which has a reactive silicon group expressed with a general formula (8), and an amino group. As an example of a reactive silicon group expressed with a general formula http://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%34%2F%2Fwww4.ipdli.. 2010/05/06

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mors pieces are preferred, and its three pisces are more preferred. Therefors, a trimethoxysilyl group or the number of an alkoxy group combined with one silicon atom of a reactive silicon group, two or (B). A trimethoxysily group, a methyl dimethoxy silyl group, an ethyl dimethoxy silyl group, an ethoxy dimethoxy silyl group, a dimethyl methoxy silyl group, a diethyl methoxy silyl group, a diethoxy methoxy silyl group, etc. can be mentioned. From a viewpoint of ester exchange reaction speed, as

As an example of an ingredient, (H) gamma-aminopropyl trimethoxysilane, gamma-aminopropyl methyl

aninoetty) aminoetty[] aminopropyl trinethoxysilane, can be mentioned. A denatured derivative and a condensation reaction thing of the above-mentioned silane compound can also use the abovegamma-(2-aminoethyl) aminopropyl cthoxy dimethoxysilane, gamma-urcido propyltrimethoxysilane, penzyl-gamma-aminopropyl trimethoxysilanc, N-n-butyl-gamma-aminopropyl trimethoxysilane, Nvinybenzyj gamma-aminopropyl trimethoxysilane. Amino group contant Silang, such as NMI-bis (gamma-trimethoxysilybropy)bethylenediamine, bis(trimethoxysilybropy)lamine, and gamma-[2-(2gamma-urcido propylmethyl dimethoxysilanc. N-phenyl-gamma-aminopropyl trimethoxysilane. Nuninopropyl methyl dimethoxysilsne, gamma-(2-aminoethyl) aminopropyl ethyl dimethoxysilane, dimethoxysilane, gamma-(2-aminocthyl) aminopropyl trimethoxysilane, gamma-(2-aminocthyl) Imethoxysilane, gamma-aminopropyl ethyl dimethoxysilane, gamma-aminopropyl ethoxy mentioned silane compound as a (H) ingredient.

The (H) ingredient used for this invention is used in 0.1-10 copies to 100 copies of organic polymers of the (A4) ingradient. It is preferred to use it in 1-5 copies especially. The above-mantioned (H) ngredient may be used only by one kind, and may earry out two or more kind mixing use. n this invention, an epoxy resin can be used as a (I) ingredient. This opoxy resin has a function which raises stability, endurance, and creep resistance further while improving impact strength and tough nature of an organic polymer which are the (A4) ingredients of this invention.

spoxy resin, A glycidyl ether type cpoxy resin of a bisphenol A propylene oxide addition, p-oxybenzoio As an epoxy resin used as a (I) ingredient of this invention, an epichlorohydrin bisphenol A type epoxy theidyl ether of tetrabromobisphenol A, Novolak type epoxy resin, a hydrogenation bisphenol A type esin, Fire retardancy type epoxy resins, such as epichlorchydrin bisphenol F type epoxy resin and scid głycidyl ether ester typed epoxy resin, m-aminophenol series epoxy resin, A

opoxy resins or novolak type epoxy resin is raised. Ranges of a using rate of these epoxy resin (I) and of an organic polymer hardoned material will become insufficient. Since a desirable using rate changes with uses of a hardensbillity constituent, etc., are not generally decided, but. For example, when of a /epoxy resin becomes less than 1/100 and a rate of (A4)/epoxy resin surpasses 100/1. intensity Jiaminodiphenylmethans system opoxy resin, a urethane modified epoxy resin, Various cycloaliphaticepoxy-resin and NN-diglyoldyl aniline, NN-diglyoldyl o-toluidine, Aithough an opoxidation thing of an unsaturation polymer, etc. are illustrated at the time, such as glyoidyl ether of polyhydric alcohol, a weight ratio. (A4) If the improvement effect of impact strength of an epoxy resin hardened material, tough nature, stability, endurance, and creep resistance becomes will be hard to be acquired if a rate mproving intensity of a hardened material of the (A4) ingredient, it is good to carry out 5-50 weightsection use of the epoxy reain five to 100 weight section still more preferably especially one to 200 currently generally used is used, and it gets. What contains an epoxy group in [two] a molecule at reactive silicon group containing organic polymer (A4) are (A4)/epoxy resin =100 / 1 - 1/100 in a east has high reactivity when hardening, and a hardened material is preferred from points --- it is easy to build three-dimensional meshes of a net. As a still more desirable thing, bisphenol A type mproving the shock resistance of an epoxy resin hardened msterial, flexibility, tough nature, peel preferably one to 100 weight section to epoxy resin 100 weight section. On the other hand, when strength, etc., it is good to carry out 5-100 weight-section use of the (A4) ingredient still more polyalkylene glycol diglycidyl ether, and glycerin, Not a thing limited to these but an epoxy resin nydantoin type epoxy resin, and petrolsum resin, at the time, such as triglycidyl isocyanurate. veight section to (A4) ingredient 100 weight section. nttp://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http\$38A\$2F\$2Fww4.ipdl.i... 2010/05/06

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used together. As an apoxy rosin hardener which can be used, thare is no restriction in particular and laturally a hardening sgent which makes a constituent of this invention harden an opoxy resin can be Friethylenetetramine, tetrasthylenapentamine, Diethylamino propylamine, N-aminoethyl piperidine, mxylylene diamine, m-phenylenediamine, diaminodiphenylmethane, diaminodiphenyl sulfone. The first desses, such as isophoronediamine and amine and polycther, second olass amines,2.4.6-tris(dimethyl Anhydrous carboxylio soid; alcohols; phenols; carboxylio acid, such as DODESHINIRU succinyl oxide, oyromellitio dishhydride, and anhydrous KUROREN acid; although compounds, such as a diketone aminomethyl) phenol, The third class amines like tripropylamine, and the saits; polyamide resin; imidazole-derivatives; dicyandiamides of these third class amines; Boron trifluoride oomplex complex compound of aluminum or a zirconium, can be illustrated, it is not limited to these. A compounds. Phthalic anhydride, hexahydro phthalic anhydride, tetrahydro phthalic anhydride, an apoxy resin hardener ourrently generally used can be used. Spacifically, for example nardening agent may also be independent or two or more sorts may be used together.

When using a hardening agent of an cpoxy resin, the amount used is the range of 0.1 to 300 weight section to epoxy resin 100 weight section.

heve moisture, it exists stably, and it is decomposed into primary amine and ketone by moisture, and produced primary amine serves as a hardcning agent of the room-tempereture-curing nature of an spoxy resin. If ketimine is used, a 1 liquid type constituent can be obtained. As such ketimine, it can Ketimine can be used as a hardening agent of an epoxy resin. In the state where ketimine does not obtain by a condensation reaction of an amine compound and a carbonyl compound.

hexamethylenediamine, p-phenylene diamine, and p.p.-biphenylene diamine, Multivalent amine, such as Polyalkylene polyamine, such as TORIECHIREN triamine and tetracthylenepentamine; Polyoxyalkylene disminobutane, pentamethylene diamine, 2,4-diaminopentane, Diamine,1,2,3-triamino propane, such as sories polyamine:gemma-aminopropyl triethoxysilane, Aminosilanes [. such as N-(bota-aminoethyl)-gemma-aminopropyl trimethoxysilane and N-(beta-aminoethyl)-gamma-aminopropyl methyl methyl triamino benzone, tris(2-aminoethyl) amine, and tetra(aminomethyl) methane; Dicthylenetriamine, compound for composition of ketimine. As an amine compound, for example, ethylenediamine, Although what is necessary is just to use a publicly known amine compound and a carbonyl propylenediamine, Trimethylene diamine, a tetramethylenediamine, 1,3-diaminobutane, 2,3dimethoxysilane,]; etc. are used, and it gets. As a carbonyl compound, acetaldehyde.

propionaldehyde, n-butylaldehyde, isobutyraldehyde, diethylaoctaldehyde, Aldehyde, such as a glyoxal and benzaldahyde; Cyclopentanone, Cyclic katonc, such as trimethyl cyclopentanone, cyclohexanone, and trimethyl cyclohexanone; Acatone, Methyl ethyl ketone, mathyl propyl ketone, methyl isopropyl cetone. Methyl isobutyl ketone, a diethyl ketone, dipropyl ketone, diisopropyl katon, Aliphatio series acetylacetone, methyl ecctoacetate, ethyl acetoacetate, dimethyl malonate, diethyl malonate, a ketone, such as dibutyl ketone end diisobutyl ketone; beta-dicarbonyl compound L such as an malonic acid methylethyl, and dibenzoylmethane, J. etc. oan be used.

glycidyl ester, such as styrene oxide; butyl glycidyl ether and allyl glycidyl ether, etc. Such ketimines may be used independently, two or more kinds may be used together and used for them, 1-100 weight-section use is carried out to spoxy rosin 100 weight section, and the amount used changes When an imino group exists in ketimine, an imino group may be made to react to glycidyl ether,

with kinds of an epoxy resin and ketimine.

silicic acid anhydride, hydrous silicic soids, and carbon black; Calcium carbonste, Bulking agents, such as magnasium carbonate, datemita, calcination clay, clay, talc, itensium oxide, bentronite, ceramio bentroline, intervo costa, a travio costa, an extensi within, and hydrogenation castor oil; farous filters, auch as asbestoe, gless fiber, and a fillment, are fluerbroted. Various bulking agents other than a minute hollow body of the (F) ingredient may be blended with a hardenability constituent of this invention. It is not limited especially as said bulking agent, but For example, fumes silice, sedimentation nature silica, Reinforcement nature bulking agents, such as a

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Introductions of the second sec

destrible read will be obtained if a builing agent choson from surfoor treatment dualised oblaim destrible read will be obtained if a builing agent choson from surfoor treatment dualised oblaim to oppose, and on the choson from many chosen from the time of the choson from any chosen from the choson from the choson from the choson from subject, the taken the range of E. Only weight section to coming opporate. (A) tho weight section of scurrent, these building specific many be used only by conclude and may mir and use two or more

(co.x.) 1 yellochability constituent of this invention, since elongation of a hardened material can be analoged on it let be building agents can be mixed if a plasticizer is used, using it together with a building agent, it amore effective.

2023)
The is another to more received.

2024 It is the individual of the entropy in the entropy

A followerly plansicion: can be used if a polymeric plansicon is used, a consequence with a case where we considered the state of the consequence
subplications, etc. are maritioned, it is not limited to these.

John allocations etc. are maritioned, it is not limited to these.

John and policious procession and the procession of the procession and
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ulthough numbers average melecular veights of a polymeric platitizer are \$500-1500 parfertable, they
ulthough numbers average melecular veights of a polymeric platitizer are \$500-1500 parfertable, they

landing integrate several anchesion segrets of a popular operation of the company from an about more experiment.

The company of the company

Uz.sol United and molecular weight of a polymeric plasticizer and molecular weight distribution (Mw/Mn) are measured by the GPC method (polystyrene conversion). Abbough a polymerol pusitioner does not have a reaction islenifor good, may have a reactive uilout group. When the sa exception isleniform to the passing source of a planticious of members of the same a reaction isleniform to the same than the same and sink of a planticious of members that are called the same preventional to the prevented When I has a reaction isleniform, it was expense por molecular add once it less pictors and 0.8 more piece on less are professed. When tunks a planticious may always a second to the same and one of the same professed was one professed with an expense of planticious one of the same and one of the same and one that the same and
(1928)
A pasticker may be used allone and may use two or more sorts together. A low molecule plasticker and as absticker may be used together. These plastickers can also be blended at the time of polymer manufacture.

The amount of plassicizer used is 30 - 100 weight acction still more protorably ten to 150 weight section preferably five to 150 weight exciton. In less than five weight sections of some state as plasticiars topos being revealed and 150 weight section. In less than five weight sections, if an effect as a plasticiars topos being revealed and 150 weight sections are acceeded, mechanical strength of a hurdened material runs siont.

It is a general formula in order to improve the activity of a condensation catalyst more in a hardwardsity constituent of this invention, R₂(ROP)₂. At Ris audistitution or an unsubstituted hardwardsity constituent of this invention, R₂(ROP)₂. At Ris audistituted or an unsubstituted becomes a few and the catalon numbers 1-20 independently among a formula respectively a is of, 1, 2 or 3. A sileon compound shown may be added. Although limitation is not carried out as said.

chains consequed prehiptricate/postaliny. Phenythrepite/postaliny. Phenythrepite/postaliny. Phenythrepite/postaliny. Since the effect that the lifest that what is an end proup of the earbon numbers 6-20 captured feature/interaction of considerate in testing the present properties and expendition resistants of considerate in testing the present properties and objectively distribucy interaction considerate and objectively considerate and objectively considerate and objectively and testing the properties and objectively the properties of the propert

[UZL] A physical properties regulator which adjusts the tractive churacteristics of a hardward metherial percented freeded to a hardwarding requirement of tracedes to a hardwarding requirement of the another properties of the hardward properties of the physical-properties regulator for example Methyl trinicoproplime. Adv. a decayation, and as demotrally intervolvent control and physical-properties and examine, threshydroprovisions, and reproperties physical properties and examine, threshydroprovisions, and an experience and assume species on properties that a properties and parameter produce properties that are properties and parameter produce properties and parameter produce properties and parameter properties and parameter produce properties and parameter properties and parameter properties and parameter properties and an Hotela minimum properties and extractive parameters are excepted properties approached properties regimens executed to properties the approached properties regimens executed to provide a their general physical-properties regimens extending entire afforms as on encriored. By visig get physiologicans as an encriored By visig get properties and a properties are a properties and a properties and a properties are a properties and a properties and a properties and a properties are a pro

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constituent of this invention is raised, or hardness is lowered conversely and elongation after fracture to be below out. The over-markinged physical-properties regulator may be used independently, and may be used loadsher two or more sorts.

intrinsmitted as compound the generates a compound which the a univalent inflam group in interinguishing a compound with the control of which the control of which the control of the cont

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A compound which generates a silican compound which is a derivative of an oxprosydens polymer A compound which in findered to Hyd-17-08384, Mr. and generates Ryd-1804(a), such as a trimetable failband, by hydrolysis can also be relied. A polymer which has a allican contact group which can seve as a hydrolysis can also be relied. A polymer which has a allican contact group which can seve as a hydrolysis can appear an expensive property of the property of

ilanol, by hydrolysis can be raised.

[0244] Prepieral-properties regulator is preferably used in the range of <math>0.5-10 weight section 0.1 to 20 weight section to 0.0 impedent 100 weight section.

Inchanging control and production, a largest is provented if medica deri in order to monova werdesdigt, a thicknotyci curri agent (largest inhibitor) may be added. Although not finited monova werdesdigt, a situatoryci curri agent (largest inhibitor) may be added. Although not finited added and a situation of the production of the added to the added to the added to the added added to the the added to the the added to the the added to the the added to the the added to the the added to the added th

ingredient 100 weight section. [0246]

used it exponent which constrains an exposy group is now endeating in a constrained or this invanion can be used if a compround which constrains an exposy group is used, the stability of a hardened material can be used the stability of a hardened material can be used so that the constraint of the co

disciplination of the property
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midner-test along was an a subject, included coopenhave, these vectors described such extension that are set of members as a subject, included coopenhave, these vectors described described and members and described and a subject of subject and a subject of the subject of the subject and a subject of the subject and a subject of the subject

A photoresist substance can be used for a constituent of this invention. If a photoresist substance is used, a coat of a photoresist substance is formed in the hardened material surface, and stickiness of substance produces physical-properties change of hardening etc. Many things, such as a constituent partly, it is mixtures, such as oligomer or it, and monomers, such as propylene (or butylene, ethylene) GURIKORUJI (meta) acrylste and neopentyl GURIKORUJI (meta) dimethacrylate, or with a molecular weight of 10,000 or less oligoesters is illustrated. Specifically, For example, special acrylate. ABONIKKUSU M-210 (2 Functional), ARONIKKUSU M-215, ARONIKKUSU M-220, ARONIKKUSU Mcontaining especially an acrylic functional group is preferred, and e compound which averages in one light, moleculer structure causes a chemical change considerably for a short time, and a photoresist 233, ARONIKKUSU M-240, ARONIKKUSU M-305 of ARONIKKUSU M-245; (three organic functions) ARONIKKUSU M-309, ARONIKKUSU M-310, Although ARONIKKUSU M-315, ARONIKKUSU M-320, a hardened materiel and the weatherability of a hardened material can be improvad. By operation of containing an organic monomer, ollgomer, resin, or them, ere known by this kind of compound, and compound, acrylic or an methaorylic system unaaturation group 1 thru/or a monomer which it hes molecule and contains the three or more functional groups is preferred. (Each ARONIKKUSU is a ARONIKKUSU M-325, (polyfunctional) ARONIKKUSU M-400, etc. can be illustrated, a compound compound, polycinnemic ecid vinyl, or azide-ized resin can be used. As an unsaturation ecrylic commercial arbitrary things can be edopted se it. As e typical thing, an unsaturation scrylic

A polychamatic acid with chiractive of many besides what is an abtrobloomy can which uses a cantamony from a sensitivation group as a polychamanic acid with an adversariation group as polychamanic acid with an adversariation group as polychamanic acid with a process of a polychamanic acid is interested. Acid-index facts is formed as formed group as a sensitization group, usually, a "hotocopolama" (Stowa 47(1912)— on March 17) besides which added a disactio compound as a ensitization great in a subservation to the subservation of the subservation and acid principal and particles with a sensitization and particles are an ensitization and a sensitization and as sensitization and sensitiation and as sensitization and sensitiation and as sensitization and as sensitization and sensitiation and as sensitiation and sensitiation

product of Toagosei chemical industry incorporated company above.)

An antioindated, relinging eagins) and used from constitution of this inventor. If an antioindar it is antioindar it is unusued, the validating eagins) and used from constitution of this inviter of an amono phenol system, as almost partial may be a more phenol system, as a more phenol system, as pilophenol system, as polyphenol system are the illustrated as an univocational system, as performed system are performed. Similarly, Trionin SIZLD, frowin 144;CHIMASSORBHALL, CHIMASSORBHALL, LAST CHIMASSORBHALL, CHIMASSORBHALL, LAST CHIMASSORBHALL, CHIMASSORBHALL, LAST CHIMASSORBHALL, CHIMASSORBHALL, LAST CHIMASSORBHARL, LAST CHIMASSORBHALL CHIMASSORBHARL, LAST CHIMASSORBHARL CHIMASSORBHARLA CHIMASSORBHARL

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shown in SANORU LS-770, SANORU LS-765, SANORU LS-292, SANORU LS-2626, SANORU LS-

114, and SANORU LS-744 (sil are the Sankyo Co., Ltd. make sbove) can also be used. An example preferred to use it in the range of 0.1 - 10 weight section to (A) ingredient 100 weight section, and of en antioxidant le indicated also to JP,H4-283259,A or JP,H9-194731,A. It is at best still more the amount of antioxident used is 0.2 - 5 weight section.

photooxidation degradation of a hardened material oan be prevented. Although a benzotriazol system, light stabilizer can be used for a constituent of this invention. If light stabilizer is used,

especially a hindered amine system is preferred. It is at best still more preferred to use it in the range of 0.1 – 10 weight section to (A) ingredient 100 weight section, and the amount of light stabilizer used is 0.2 – 5 weight section. An example of light stabilizer is indicated also to JP.19-194731.A. a hindered amine system, a benzoate system compound, etc. can be illustrated as light stabilizer,

stabiliser as a hindered amine light stabiliser as indicated to JP,H5-70531,A because of preservation constituent of this invention, it is preferred to use a tertiary amine content hindered amine light When an unsaturation acrylic compound is used especially as a photoresist substance in a

stability improvement of a constituent. As a tertiary amine content hindered amine light stabiliser. ** inuvin 622LD and tinuvin 144; CHIMASSORB119floor line. (All are the Ciba-Geigy Japan, Inc. make sbove);MARKLA-57, LA-62, LA-67, LA-63 (all are ADEKAAGASU chemicals incorporated company meke sboye): SANORU LS-765, LS-292, LS-2626, LS-1114, LS-744, (All sre the Sankyo Co., Ltd. make above) etc. -- light stabilizer can be illustrated.

penzophenone series, a benzotriazol system, a salicylate series, a substitution tolyl system, a metal absorbent is used, the surface weatherability of a hardened material can be improved. Although a An ultraviolet ray absorbent can be used for a constituent of this invention. If an ultraviolet ray

- 5 weight section. It is preferred to use together and use a phenol system, a hindered phenolic weight section to (A) ingredient 100 weight section, and the amount of ultraviolet ray absorbent used penzotriazol system is preferred. It is at best still more preferred to use it in the range of 0.1 - 10 antioxidant, a hindered amine light stabiliser, and a benzotriazol system ultraviolet ray absorbent. chelate system compound, etc. can be illustrated as an ultraviolet ray absorbent, especially a

hardenability constituent of this invention, for example, was described above is blended, it kneeds under ordinary temperature or heating using a mixer, a roll, a kneeder, etc., or an ingredient is issolved using a little suitable solvents, a usual method of mixing is adopted, and it gets. A many An ingredient which limitation in particular does not have in the method of preparation of a

iquid [, such as 1 liquid type and a two-component type.] type compound can also be msde snd used by combining these ingredients suitably.

noisture, it will form network structure in three dimensions, and will harden it promptly to a solid f a hardenability constituent of this invention is exposed into the atmosphere, by operation of which has rubber-like electicity. t faces using a hardenability constituent of this invention, if needed Adhesive improving agents other than an aminosilane, a physical-properties regulator, it is possible to add suitably various additive deactivator, anti-ozonant, light stabilizer, amine system radical chain inhibitor, the Lynn system agents, such as a preservation stability improving agent, an ultraviolet ray absorbent, a metal peroxide decomposition agent, lubricant, paints, and a foaming agent.

seeling agent, pre-insulation an electric wire, material for cables, Elastic adhesives, powder coatings, nsulstion msterials, such as electric electronic component materials, such as a solar cell rear-face A hardenability constituent of this invention can be used for sealant, such as a binder, a building, a narine vessel, and a super highway, adhesives, modeling material, a vibroisolating meterial, a sound deadener, a sound insulating material, a charge of foam, a paint, a gunning material, etc. Electrical casting material, a medical-application rubber material, a medical-application binder, A sealing http://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdi1... 2010/05/06

naterial for masonry joints of sheething materials, such as a medical equipment scalent, food packing

in various molding materials and wired sheet glass and a scaling agent for rust prevention / water proof of the glass laminate and face (cut section), autoparts, elsotrical machinary parts, several kinds arge area, such as glass, porcelain, wood, metal, and a resin-molding thing, it is usable also as various electric electrons, a film, a gasket, it is available for various uses, such as a fluid-sealant agent used from excelling in stability, endurance, and creeping property. Adhesives for interior panels, adhesives of machine part, etc. Since, or help of a primer is borrowed and it may stick to substrates of a **** inishing adhesives, adhesives for finishing of wall, adhesives for car panels, it is desirable, especially seal constituents and adhesion constituents of a type. A hardenability constituent of this invention precision-mechanical-equipment assemblies, a sealing material for direct grazing, a sealing material naterial, and a sizing board. A coating material, a primer, a conductive material for electromagnetic or face panels, adhesives for tiling, adhesives for stone tensions, Ceiling finishing adhesives, floor for multiple glass, a sealing material for speed signal generator construction methods, or a sealing wave cover, a thermally conductive material, A charge of a hot melt material, a potting agent for when it is considered as the electrical and electric equipment, an electron and adhesives for

material for working joint of a building and uses. Effect of the Invention] Best Mode of Carrying Out the Invention]

Although working example is hung up over below and this invantion is explained to it in more datail.

The hardensbility constituent of this invention is excellent in stability, endurance, and oresp

this invention is not limited only to these working example.

(Synthetic example 1)

Use polyoxypropylene triol of the molecular weight 3,000 [about] as an initiator, and propylene oxide equivalent was added 1.2 times to the hydroxyl group of this hydroxyl group end polypropylene oxide. carrying out mixed etirring of the water 300 weight section and centrifugal seperation removed water molecular weight about 26,000 (polystyrene reduced molecular weight in which the column measured the solvent using THF using the TOSOH TSK-GEL H type using TOSOH HLC-8120GPC as a liquidobtained], n-hexane 300 weight section, After it carried out mixed stirring of the water 300 weight and methanol was distilled off, and also the allyl chloride was added, and the hydroxyl group of the gain, decompression devolatilization removed hexane. By the above, the end obtained 3 organiosending system) polypropylene oxide was obtained. Then, the methanol solution of NaOMe of the end was changed into the allyl group. Decompression devolatilization removed the unreacted allyl is polymerized in a zinc hexa cyanocobaltate glyme complex compound catalyst, Number average chloride. To ally end polypropylene oxide 100 weight section which is not refined [which was section further at the hexane solution obtained by centrifugal separation removing water after

react to methyl dimethoxysilane 1.4 weight section at 90 ** for 5 hours, and the methyl dimethoxy made into a catalyst to allyl end polypropylene oxide 100 obtained weight section, It was made to 150 ppm of platinum content 3wt% of platinum vinyl siloxane complexes isopropanol solutions are

silyl group end polyoxyalkylene series polymer (A-1) was obtained. Measurement by 1H-NMR (it

unctions polypropylene oxide of the number average molecular weight 26,000 [about] which is en

sllyl group.

measures in a ODC1₃ solvent using JEOL JNM-LA400) averaged the methyl dimethoxy silyl group of the end per molecule, and they were 2.3 pieces.

duplexs, and light stabilizer (the Sankyo maks.) SANORU LS7701 weight scotion and an ultraviolet ray colloid caloium carbonate (product made from Shiraishi industry, Hakuenka CCR) 120 weight section. Trantum oxide (Ishihara Sangyo make, TIPAQUE R-820) 20 weight section, DIDP55 weight section, the amount part of thixotropic grant agant (made in [Kusumoto Chemicals], DISUPARON 6500) synthetic example 1 according to the combination formula shown in Table 1, Surface treatment Organic polymer (A-1) 100 weight section which has the reactive silicon group obtained in the (Working example 1-4 and comparative examples 1-2)

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in a col coat, javen in three weight sections and Table I Mada in an ethyl silicate 22; col coat, othyl silicate 40; Made in a col coat, a curing catelyst (that Japanes asset — transformation— make and the districtly bissecrybjacetomet (trade name U-220), Japanese asset—transformation— make and the product make Brode and Coat (faviently Upanese) asset—transformation—make and the product make Brode and the (faviently Upanese) asset—transformation—make and the product make Brode and the Coat (faviently Upanese) asset—transformation—make and the product make Brode and the Coat (faviently Upanese). nade from Ouchi Shinko Chemical industry, NOKURAKKU SP) 1 waight section, The amount part of (aminoethyl)-gamma-aminopropyl trimathoxysilane (the Nippon Unioar make.) A-1120) silicate (made dehydrator vinyltnimetoxysilana (Nippon Unicar make, A-171) duplexs, adhesion grant agent N-bctabsorbert (made in Tiba Specialty Chemicals.) Tinuvin 3271 weight section, antioxidant (product

(Hauling physical properties of a hardened material)

nature constituent was obtained.

in the amount part of methylaticuts 51 duploxs, and Table 1 Neo decanoic and (trade name BASA tick 10); the description to Table 1 of the Wide Draw Chemical Industries make and laury amine carried out number—of-corps addition, the Necading in the state where moisture does not exist an absolantally under dying conditions, it sealed in the damppool container and I Tiguil and revolution.

type, and traving pulled by a part for 200-mm/fn hauling speed, and was extended at the time of trientsity MPs) and Esthectures a than time of M80500s hauling modulus (MPa) and Tichresbure, and (S) was neasted A result is allown in Table 1. It was 23 **x3 +50 **x recuperated in the class product of Table 1 on the 4th, and the sheet about 3 mm thick was created. [per day] it examined by having pierced this sheet to the No. 3 dumbbell

(Recovery)

It was 23 **x3 +50 **x recuperated in the class product of Table 1 on the 4th, and tha sheet about 3 mm is pulled to 40 mm between the marked lines (100% extension), it fixed at 60 ** for 24 hours. The recovery was measured from the rate which opened this wide at 23 ** and the marked line restored. I have afterward, it means that the one where the recovery is larger is excellent in stability. A result mm thick was created. [per day] This sheet was pierced to the No. 3 dumbbell type, and where 20 is shown in Table 1.

Creep measurement using the piece of a dumbbell)

it was 23 **x3 +50 **x recuperated in the class product of Table I on the 4th, and the sheet about 3 mm thick was created. [per day] This sheet was pierced to the No. 3 dumbbell type, and the marked line of 20 mm of intervals was described. The end of this piece of a dumbbell was fixed in 60 ** oven, mentioned tension physical-properties measurement of this hardened material was imposed on the lower and of the hung piece of a dambebl. The displacement difference of the distance between the marked lizes of 200 hours hard immediately after imposing load was measured. It means that the one have a displacement difference is smaller is oxodered in oxee presistance. A result at lower in Table Where a displacement difference is smaller is oxodered in oxee presistance. A result at lower in Table and the piece of a dumbbell was hung. 0.4 time as much load as M50 value obtained by the above-

480	382	389	442	400	Z6Z	(%)	ф∃	
2.23	96 I	2,35	2.61	2,27	2,00	(RPA)	q⊥	
0.43	0.42	09.0	84.0	94.0	0.53	(A9M)	09W	硬化物物性
2.2	30.2	1 t	1.2	9.1	12.1	(mm)	4-1	
08	97	98	88	78	79	(%)	率元	33
91 0		97.0	91.0	91.0		くきてれりかて	75 <u>7</u>	
1.2		1.2	1.2	1.2		0146744V	緒く。おれた	
3.4		3.4	3.4	3.4		09-N/4Y4¥	业、XX额(、*Mt	
	7				7	444970-220	*XX数青	凝止触媒
		2				134-41/4474		
			7			044-41/41		
				7	7	1±10014-158	代類(B)	1-466
3	3	3	3	3	3	A-1120	(権 を は は	
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7		Þ	3	2	1			
1632	क्रम		16/3	放実		1	(陪量重) 放起	*

catalyst, especially the recovery of creep resistance is low bad silicate additive-free. However, as As shown in the comparative example 1 of Table 1, when organic tin (U-220) is used as a curing shown in working example 1, stability and creep resistance are notably improved by addition of

carboxylic acid tin salt (neo SUTAN U-50), etc. as a curing catalyst, stability and creep resistance also with good silicate additive-frec are shown, but. As shown in working example 2-4, stability and orasp resistance further outstanding by silicate addition were shown. The ethyl silicata 40 and tha methylsilicate 51 which were usad in working example 3-4 are a condensate of a tetracthoxysilane silicate. As shown in the comparative example 2, when organic tin (U-220) is used for ****, and a tetramethoxy silane, respectively, and showed the especially outstanding effect [0287] http://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fww4.ipdli... 2010/05/06

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Synthetic axample 2)

polocytopropiera golgo of the modellar weight 2006 (cheval) as an intellerior and the britoxyol group and polocytopologica golgo of the number severage molecular weight 14500 (chevat) and and polocytopologica codie in the since operational general general composition and stability in east, and an experient general conference and the several composition codie in the since operation general composition codie and conference of the seminate production as the southful composition sends of the seminate production and the southful composition codie and the same procedure are the synthetic composition codie the polycocytologican endes are the synthetic composition to the polycocytologican endes are the synthetic composition to the polycocytologican endes polymer (A-C2) which has an everage of the control of the polycocytologican endes polymer (A-C2) which has an everage of the control of the polycocytologican endes polymer (A-C2) which has an everage of the control of the polycocytologican endes polymer (A-C2) which has an everage of the control of the polycocytologican endes polymer (A-C2) which has an everage of the control of the polycocytologican endes polymer (A-C2) which has an everage of the control of the control of the polycocytologican endes polymer (A-C2) which has an everage of the control of the cont

1.5 trimethoxysilyl groups at the end was obtained.

(Synthetic example 3)

To the allyl end polypropylene oxide obtained in the synthetic example 2, in the same procedure as the synthetic example 1, it was made to react to triethocystlane and the polyboxalikylene series downer (A-3) which has an average of 1.5 triethoxy silvy groups at the ord was obtained.

(Synthetic example 4)

To the ably end polypropyiers oxide obtained in the synthetic acample 2, in the same procedure as whitelies example; it was made to react to methy dimethoryalizen and the polypoyalkyden entire polymer (A-4) which has an average of 1.5 methy dimethoxy also groups at the end was necessary. Working compile 5–11 and comparative examples 3–9.

Working committee 5–11 and comparative examples 3–9.

Working the comparative of the comparative of the comparative of the comparative formal shown in Table 2. Surface treatment examples 2–4 according to the combination formal shown in Table 2. Surface treatment examples contain make form Schmalic intersty, Husband COS(1) 30 welfact section. The comparative of the comparative

depicos, and giller stabilizar (this Sandyo mixed a Neumanico Chemicals, LISU-BANNS (8500)
depicos, and giller stabilizar (this Sandyo mixed 3 MoRDAIL ISTIVI) weight section and an ultraviolet tre foreober
make from Obtal Statuko Chemical Industry, NOCHIRAKKO 1891 v. weight section and an ultraviolet tre
make from Obtal Statuko Chemical Industry, NOCHIRAKKO 1891 v. weight section. The amount past of
make from Obtal Statuko Chemical Industry, NOCHIRAKKO 1891 v. weight section. The amount past of
weight are vegetarized vegetarized industry, NOCHIRAKKO 1891 v. weight section. The amount past of
weight are vegetarized vegetarized industry, NOCHIRAKKO 1891 v. weight section. The secondary
weight are vegetarized vegetarize

ivas organea. 10211] It examined by having pulled by the same method as the above-mentioned using the class product of

Table 2, and was experted at the time of intensity (MPa) and Ebfracture at the time of M50,50% Table 2, and was experted at the time of intensity (MPa) and Ebfracture, at the time of M50,50% (0772)

The rocovery was measured by the same method as the above-mentioned using the class product of lable 2 however, the strathed state was fixed at 23 ** 100% for 24 hours this thrin, and the recovery value ameasured from the rate which opened this wide at 23 ** and the marked line restored thour afterward. A result is shown in 18be 2.

The open ensurance utilizing a cheek surplush that the open surplushing the ** nample which The deplecement difference with the 140-holour back immediately other creating the ease product of Table 2 is not carried an area of 20 mm x 25 mm and 1 mm in thickness using the class product of Table 2 the carried to 1814 with a reasonable 22 seed 4 alone %. I back of much in 100 % event, and misself to 1814 was measured. [1 or day] The deplecement efference made 0 x for the thing below misself seed was measured. nttp://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdli... 2010/05/06

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0.4 mm, and the displacement difference carried out a thing of 0.4 mm or more. A result is allown in [1026.4] [1026.4]

0.2 1.01 × 1.01	96 96 96 91 7	96 1,15 0 2 20	0.92 80.2	0. 92 0. 92 0. 93	0 1, 13 93	5' 50 0' 82 O	54 84 03
× 19	86 0	0	O 16	0	0	0	7
L9	96 96		† 6				
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	泰州校科科 秋林	⊅- ∀]		
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10	基础设料机	S-A	代類	(FA)	村合重銀青		
ç	監解の基						
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5, stability and creep resistance are improved notably. Working example 10 which added silicate, and working example 11 using carboxylic acid tin salt (nec SUTAN U-50) as a curing carboxylic acid tin salt (nec SUTAN U-50) as a curing carboxylic acid tin salt (nec SUTAN U-50). When the resotive allicon group of an end uses the organic polymar (A-2-3) which is the Tori alkoxy silyl groups from comparison with working example 5-9 of Table 2, and the comparative examplas 3urther outstanding recovery.

Synthetic example 5)

To the allyl end polypropylene oxide obtained in the synthetic example 1, in the same procedure as the synthetic example 1, it was made to react to methyl dimethoxysilane and the polyoxyalkylene series polymer (A-5) which has an average of two methyl dimethoxy silyl groups at the end was

Synthetic example 6)

used, Metallyl end polypropylene oxida was obtained in the sama procedure as the synthetic example group end polypropylene oxide of the number average molecular weight 26,000 [about] produced by colymerizing propylene oxide in the zinc hexa cyanocobaltate glyme complex compound catalyst is Jee polyoxypropylene triol of the molecular weight 3,000 [about] as an initiator, and the hydroxyl olatinum vinyl siloxane complaxes isopropanol solution is made into a catalyst to this metallyl end except making an allyl chloride into chloridation metallyl. 0.5 copy of platinum centent 3wt% of

ander the atmosphere of the nitrogen to contain, it was made to react to methyl dimethoxysilane 3.2 weight section at 90 ** for 5 hours, and the polyoxyalkylene series polymer (A-6) which has an polypropylene oxide 100 waight section, oxygen -- 6vol% -- mixed aulfur at a rate of 1 eq/Pt1eq average of 2.8 methyl dimethoxy silyl groups at the end was obtained.

Organio polymer (A-1, A-4-6) 100 weight section which has the reactive silicon group obtained in the synthetic example 1 and the synthetic examples 4-6 according to the combination formula shown in able 3, Surface treatment colloid calcium carbonate (product made from Shiraishi industry. (Working example 12-14 and comparative example 6)

Kusumoto Chemicals J, DISUPARON 6500) duplexs, and light stabilizer (the Sankyo make.) SANORU _S7701 weight section and an ultraviolet ray absorbent (made in Tiba Spacialty Chemicals.) Tinuvin dakuenka CCR) 120 weight section, Titanium oxide (Ishihara Sangyo make, TIPAQUE R-820) 20 veight section, DIDP55 weight section, the amount part of thixotropic grant agent (made in

SP) I weight section, As the amount part of dehydrator vinyltrimetoxysilans (Nippon Unicar make, A-3271 weight section, antioxidant (product made from Ouchi Shinko Chemical industry, NOKURAKKU 71) duplexs, adhesion grant agent N-beta-(aminoethyl)-gamma-sminopropyl trimethoxysilsne Nippon Unicar make, A-1120) 3 weight section, and a curing catalyst, Carboxylic acid tin salt

BASA tick 10)) 1.2 weight section and amine (Wako Pure Chemical Industries make, lauryl amine) 0.75 weight section are added After knesding in the state where moisture does not exist substantially Japanese east transformation make, neo decanoic acid tin (divalent) (trade name: U-50)) 3.4 weight section, Carboxylio acid (product made from Japan epoxy resin, neo decanoio acid (trade name: under drying conditions, it sealed in the dampproof container and 1 liquid mold-curing nature

constituent was obtained.

It examined by having pulled by the same method as the above-mentioned using the class product of able 3, and was extended at the time of intensity (MPs) and Eb:fracture at the time of M50.50% hauling modulus (MPa) and Thifracture, and (%) was measured, A result is shown in Table 3.

The recovery was measured by the same method as the above-mentioned using the class product of Tabia 3. However, the stretched state was fixed at 60 ** 100% for 24 hours this time, and the recovery was measured from the rate which opened this wide at 23 ** and the marked line restored hour afterward. A result is shown in Table 3.

he displacement difference of the distance between the marked lines of 200 hours after immediately

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mathod as the method of working example 1-4, using the class product of Table 3, was measured. A after performing creep messurement using the piece of a dumbbell, and imposing load by the same result is shown in Table 3.

	ΕP		(%)	109	483	273	205
	ЧT		(Mp.8)	2, 39	2.30	1.87	2.02
確化物物体	0 9 W	(sqM)		0.35	0.43	89 0	0.38
	2-1		(um)	2.5	2.2	1.3	3.2
動	率元		(%)	87	18	98	£L
	755		CELMING	91.0	97.0	94.0	GL '0
	数で、木札	,i	0144174-7	1.2	1.2	1.2	1.2
	献 "AX 綾く" 木札		09-04474	3.4	3.4	3.4	3.4
	(持年初		0211-A	3	3	3	3
	廃水		171-A	7	7	7	2
	廃土初	d\$4% <u>4</u> 4/		1	T	1	1
	唐邓琬	₹₹£° >327		1	1	1	1
	除 宏5		0LL-S7#-/4		Ţ	1	1
	性付与剤	7. 131/ ED #6500		7	7	7	3
[12]	除壁		D10P	99	99	99	99
		4	(v46-850	20	50	50	50
. A	林萸		ADO華體 产	150	150	120	150
1		⊅ – ∀	1.5個				001
		8 – A	图8.2			100	
		1 - A	2,3個		100		
本合重数青	公款(SA)	3 - A	图,0,2	100			
			基素トヤ對為灵	12	13	71	9
(暗量重) 坂脉			06348741	吸效力 原納実			

Comparison with working example 12–14 of Table 3 and the comparative example 6 shows that the organic polymer with many reactive silicon groups per molecule (A–1, A–5–6) is excellent in stability and creep resistance.

Jse polyoxypropylene glycol of the molecular weight 2,000 [sbout] as an initiator, and the hydroxyl (Synthetio example 7)

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used, Metallyl and polypropylane oxide was obtained in the sama procedure as the synthetic exampla group and polypropylene oxide of the number average molecular weight 28,500 [about] produced by To this metallyl end polypropylene oxide, in the same procedure as the synthetic example 6, it was solymerizing propylene oxide in the zinc hexe cyanocobaltate glyme complex compound catalyst is

made to react to methyl dimethoxysilane and the polyoxyalkylena series polymar (A-7) which has an

average of 1.9 methyl dimathoxy silyl groups at the and was obtained.

(Synthetic example 8)

as the synthetic example 6, it was made to react to methyl dimethoxysilane and the polyoxyalkylene series polymer (A-8) which has an average of 1.5 methyl dimethoxy silyl groups at the end was To the metallyl end polypropylene oxide obtained in the synthetic example 7, in the same procedure

(Synthetic example 9)

group and polypropylene oxide of the number average molocular weight 28,500 [about] produced by To this ally! end polypropyiene oxide, in the same procedure as the synthetic example 1, it was mada Use polyoxypropylene glycol of the molecular weight 2,000 [about] as an initiator, and the hydroxyl used, Allyl end polypropylene oxide was obtained in tha sama procedure as the synthetic example 1. polymerizing propylene oxide in the zinc hexa cyanocobaltate glyma complex compound catalyst is

to react to methyl dimethoxysillane and tha polyoxyalkylene sariaa polymar (A-9) which has an average of 1.5 methyl dimethoxy silyl groups at the end was obtained.

Organic polymer (A-4, A-7-9) 100 weight section which has the reactive silicon group obtained in the synthetic example 4 and the synthetic examples 7-9 according to the combination formula shown in Hakuenka CCR) 120 weight section, Titanium oxide (Ishihara Sangyo make, TIPAQUE R-820) 20 Table 4, Surface treatment colloid calcium carbonate (product made from Shiraishi industry, (Working example 15-16 and comparative examples 7-8)

Fusumoto Ohemicals], DISUPARON 6500) duplexs, and light stabilizer (the Sankyo make.) SANORU LS7701 weight section and an ultraviolet ray absorbent (made in Tiba Specialty Chemicals.) Tinuvin weight section, DIDP55 weight section, the amount part of thixotropic grant agent (made in

dibutyItin bisacetylacetonate (Japanese east transformation make, neo SUTAN U-220) duplexs were 2271 weight section, antioxidant (product made from Ouchi Shinko Chemical industry, NOKURAKKU duplexs, adhesion grant agent N-beta-(aminocthyl)-gamma-aminopropyl trimethoxysilane (the SP) I weight section, The amount part of dehydrator vinyltrimetoxysilane (Nippon Unicar make, A-Vippon Unicar make.) A-1120) Three weight sections and the amount part of ouring catalyst added, after kneading in the state whare moiature does not exist substantially under drying It examined by having pulled by the same method as the above-mentioned using the class product of Table 4, and was extended at the time of intensity (MPa) and Eb:fracture at the time of M50:50%

conditions, it scaled in the dampproof container and 1 liquid mold-curing nature constituent was

he recovery was measured by the same method as the above-mentioned using the class product of recovery was measured from the rate which opened this wide at 23 ** and the marked line restored Table 4. However, the stretched state was fixed at 23 ** 100% for 24 hours this time, and the hauling modulus (MPa) and Tb:fracture, and (%) was measured. A result is shown in Table 4. 0289

he displacement difference of the distance between the marked lines of 45 hours after immediately after performing creep measurement using the piece of a dumbbell, and imposing load by the same method as the method of working example 1-4, using the class product of Table 4, was measured. A result is shown in Table 4.

24 hours afterward. A result is shown in Table 4.

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Τ̈́R	101	6101	259		(%)		EР	T	
	2.6	3,02	17.2		(59M)	41			
	1.0	0.21	14.0		(MPa)	MSO	硬化物物性		
7		77	12		(11311)		6-64		
7	L	1/8	98		(%)			元數	
1	7	7	7		4474501-220			は一種に	
T	3	3	3		A-1120			接着性	
\top	7	7	7		171-A	_	廃水朔		
T	1	1	1		4844441	除北部小鍾			
	1		ı		₹₹£, >35,7	廃			
T	1	1	ı		OLL-S711-14		(安米		
Τ	7	7	7	0	JG9# <a '\\x\\="" td="" †<=""><td></td><td>村 ハ 4キ</td>		村 ハ 4キ		
Т	99	99	99		9010		嵭	壁筒	
1	50	50	50		44·4B-850				
	150	150	150		A00華體白		# *	蔚 充	
Τ				1.5個	霍仙 亿	<i>v</i> − ∀			
1	100			1.5個	春似 亿	6 – A			
Τ		100		图 1	型机4人	8 – A	J	l	
Т		_	100	E/6 'I	看40.44	7 – A	(€A)	 本日本 本日本 本日本 本日本 本日本 本日本 本日本 本日 1 1 1 1 1 1 1 1 1 	
Т	L	91	91	基素下寸對為灵	煮薪Q基齡末Q 确				
<u>φ</u> 1	Ħ	1693	放実	のりさる千代「	人等基案付計引灵		(暗量重) 如	B#	

[0292]

Comparison with working example 15–16 of Table 4 and tha comparative examples 7–8 shows that the organic polymer (A-7-8) which introduced the reactive silicon group to the metallyl group and http://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdl.i.. 2010/05/06

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Synthetic example 10)

To the allyl and polypropylene oxide obtained in the synthetic example 1, in the same procedure as the synthatic example 1, it was made to react to triethoxyailane and the polyoxyaikylene series polymer (A-10) which has an everage of 2.3 tricthoxy silyl groups at the end was obtained. 0294]

Organic polymer (A-1, A-10) 100 weight section which has the reactive silicon group obtained in the Working example 17 and comparative examples 9-10)

nade from Ouchi Shinko Chemical industry, NOKURAKKU SP) 1 weight section, As a dehydrator, the able 5. Surface treatment colloid calcium carbonate (product made from Solvay, Winnoffi SPM) 120 weight section, Titanium oxide (product made from Kerr-McGee, RFK-2) 20 weight section, DIUP50 weight section, Thixotropic grant agent (product made from Gray Valley, Crayvallacsuper) 5 weight synthetic example 1 and the synthetic example 10 according to the combination formula shown in absorbent (made in Tiba Specialty Chemicals.) Tinuvin 3271 weight section, antioxidant (product section, light stabilizer (Sankyo make, SANORULS770) 1 weight section and an ultraviolet ray

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triethoxysilane (the Nippon Unicar make.) which is the (G) ingredient as an adhesion grant agent A-100) Or add N-beta-(aminoethyl)-gamma-aminopropyl trimethoxysilane (Nippon Unicar make, Aamount part of vinyltrimetoxysilane (Nippon Unicar make, A-171) duplexs, gamma-aminopropyl 120) 3 weight section and the amount part of curing catalyst dibutyltin bisacstylacetonate

Japanese cast transformation make, neo SUTAN U-220) duplexs. After kneading in the stata where noisture does not exist substantially under drying conditions, it sealed in the dampproof container and I liquid mold-curing nature constituent was obtained. The recovery was measured by the same method as the above-mentioned using the class product of Table 5. However, the stretched state was fixed at 60 ** 100% for 24 hours this time, and the recovery was measured from the rate which opened this wide at 23 ** and the marked line restored

he displacement difference of the distance between the marked lines of 140 hours after immediately after performing creep measurement using a shear sample and imposing load by the same method as the method of working example 5-11, using the class product of Table 5, was measured. As for the valuation basis, the displacement difference made 0 x for the thing below 0.4 mm, and the hour afterward. A result is shown in Table 5.

displacement difference carried out a thing of 0.4 mm or more. A result is shown in Table 5.

The class product of Table 5 was thinly langthenod in thickness of sbout 3 mm, and time (leather— covered time) until the surface etratches a hide under 23 ** and 50% of humidity RH conditions was nessured. The one where leather-covered time is shorter means that hardenability is excellent. A (Hardenability of a hardenability constituent) esult is ahown in Table 5.

(nim)		劣猫鸻					
(uim)		前類視	間報郵丸				
		(堀7斗) よーい4					
(%)		率元獻					
74-07-22	k ¥	料姆	가 좌				
¥41/14	A-1120						
HI1H	0011-A	会類(5)	済まいまり 所書 対				
ITI-A,		廃水朔					
d\$46441		降北切外麵					
¥5.337	£	廃 郊 奴 縣 代 梁					
LL-STI-		脩宝安光					
allac si	VVBIO	(サリカ ハイキ					
ania		廃墾店					
BFK-2							
R lifon		林 東 尭					
44 .641£x							
キィエリ・イ	0 r - A	会 類 (4 A)					
の 輩		(JEST) WIT	ale				
<u> </u>		(帝量重) 热肚	*				

preep resistance, change of the skinning time in storage order is small, and storage stability is good. agent is combined with the end of the (A4) ingredient using the polymer which has a triethoxy sily! If the aminosilane which has a triethoxy silyl group which is tha (G) ingredient as an adheaive gram group as an organio polymer as shown in working exemple 17 of Table 5, Excelling in stability and

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comparative example 12, after promoting the exter exchange reaction between reactive alloon groups by recuperating oneself for seven days it 50 et whitesel fluid indeed variety nature constituents, the leather-royered time test was performed under 50% of 23 et humidity. His conditions. A result is transformation make, neo SUTAN U-220) duplexs were sealed in the glassware which carried out the nitrogen purge, and 1 liquid mold-curing nature constituent was obtained. In the comparative example 11, the leather-covered time test was performed under 50% of 23 ** humidity RH conditions, without recuperating oneself in this 1 liquid mold-curing nature constituent. In working example 18 and the section and a dehydrator -- triethoxysllana (made in a col coat.) the N-beta-(aminoathyl)-gammaaminopropyl trimethoxysilane (the Nippon Unicar make.) which is the (H) ingredient as the amount part of ethyl silicate 28 duplexs, and an adhesion grant agent A-i120) or N-beta-(aminoethyl)-gamma-aminopropyl triethoxysilane (the Shin-Etsu Chemical make.) It added, KBE-6033 weight synthetic example 2 according to the combination formula shown in Tabla 6, as DIDP30 weight Organic polymer (A-2) 100 weight section which has the reactive silloon group obtained in the section and the amount part of curing catalyst dibutyltin bisacetylacetonate (Japanese east Working example 18 and comparative examples 11-12)

shown in Table 6. [0301] [Table 6]

15	13	3	(uim)		間報	間報影虫		
阜	当	阜		主義の	日 L × つ。09			
2	7	7	7920-220	ţţ	欺 賴	가郠		
3			基小小小村工门	KBE-603				
	3	3	基小八八十八八	0S11-A	长 類 (H)	トトラストルトル・ファイン・ドラスト しょうしょう しょう しょう しょう しょう しょう しょう しょう しょう		
7	Z	7	824-40公4年					
30	30	30	9010					
001	100	100	基机代料工时	S – A	长 類 (▶ A)	本合重熱市		
15	11	18	が帯の基					
图数	印	刚耐実	素トヤ卦初凤	(帝量重) 丸脉				

[0302]

As ahown in working example 18 of Table 6, the polymar which has a triethoxy silyl group is used for the end of the (A4) ingredient as an organic polymer. If the aminosilans which has a methoxy siful

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eaction is promoted by care of health, the hardenability of an organio polymer can be raised notably group which is the (H) ingredient as an adhesive grant agent is combined and an ester exchange

Working example 19-20 and comparative example 13)

industry, Hakuenka CCR) 120 weight section, Titanium oxide (Ishihara Sangyo make. TIPAQUE R-820) Kusumoto Chemicals J. DISUPARON 6500) duplexs, and light stabilizer (the Sankyo make.) SANORU LS7701 weight section and an ultraviolet ray absorbent (made in Tiba Specialty Chemicals.) Tinuvin 3271 weight section, antioxidant (product made from Ouch! Shinko Chemical industry, NOKURAKKU 71) duplexs, adhesion grent agent N-beta-(aminoethyl)-gamma-eminopropyl trimethoxysilane (the SP) I weight section. The amount part of dehydrator vinyltrimetoxysilane (Nippon Unicar make, Asynthetic example 10, Surface treatment colloid calcium carbonete (product made from Shiraishi Organic polymer (A-10) 100 weight section which has the reactive silicon group obtained in the 20 weight section, DIDP55 weight section, the amount part of thixotropic grant agent (made in Vippon Unicar make.) A-1120) Three weight sections and the various below-mentioned curing

catalyst of the (E) ingredient as a curing catalyst what carried out concomitant use addition of BASA vas obtained, the neo decanoic acid (the product made from Japan epoxy resin.) which is a non-tin Mataumoto Trading make.) What carried out Olga Chicks TC-750 8.5 weight-saction addition was tick 106 weight section and the amine (Wako Pure Chemical Industries make, lauryl amine) 0.75 voight section --- working example 19 and isopropoxy titanium bis (ethylacetoacetate) (the

catalysts were added, after kneading in the state where moisture does not exist substantially under

arying conditions, it sealed in the dampproof container and 1 liquid mold-curing nature constituent

oisacatylacetonate (Japanese east transformation make, neo SUTAN U-220) duplexs was made into nade into working example 20. What carried out the amount part addition of dibuty/tin the comparative example 13.

As a result of measuring the recovery by the same method as the above-mentioned using these 0304]

blass products, the hardened material of working example 19 and working example 20 showed the ecovery higher than the hardened material of the comparative example 13.

Synthetic example 11)

to react to triethoxysilane and the polyoxyallylene series polymar (A-11) which has an average of 1.5 group end polypropylene oxide of the number average molecular weight 25,500 [about] produced by o this allyl end polypropylene oxide, in the same procedure as the synthetic example 1, it was mada ise polyoxypropylene giycol of the moleculer weight 2,000 [about] as an initiator, and the hydroxyl used, Allyl end polypropylene oxida was obtained in the same procedure as the synthetic example 1. polymerizing propylene oxide in the zinc hexa cyanocobaltate glyme complex compound catalyst is riathoxy silyl groups at the end was obtained.

to the allyl end polypropylene oxide obtained in the synthetic example 11, in the same procedura as the synthetic example 1, it was made to react to methyl dimethoxysilane and the polyoxyalkylene series polymer (A-12) which has an average of 1.5 methyl dimethoxy silvl groups at the end was (Synthetic example 12)

Working example 21 and comparative examples 14-15)

saction, thixotropic grant agent (made in [Kusumoto Chemicals], DISUPARON 305) 3 weight acction, salcium carbonate (product made from Shiraishi industry, BISUKO light R) 60 weight section, Heavycalcium-carbonate (product made from Shiroishi calcium, HOWAITON SB) 20 weight section, DOP40 and a photo-setting resin (the Tosgosei make.) ARONIKKUSU M-3093 weight saction, light stabilizer Sankyo make, SANORULS770) 1 weight section, Ultraviolet ray absorbent (made in [Tha Specialty Chemicals], tinuvin 327) 1 weight section, Zero copy of minute hollow body (the product made from Drganic polymer (A-11, A-12) 95 weight section which has the reactive silicon group obtained in the weight section, epoxy system plasticizer (New Japan Chemical make, SANSO sizer EP-S) 20 weight product made from Shiraishi industry, Hakuenka CCR) 60 weight section, Surface treatment colloid synthetic example 11 and the synthetic example 12, Surface treatment colloid calcium carbonate

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using (A-12) as an organic polymar, and what edded 20 copies of minute hollow bodies was made into Chemicals], IRUGA NOx 1010) 1 weight section and tha (F) ingrediant, or 20 copies were measured. the Fuil SHIRISHIA chemicals, the FUJIBA luna H-40) which is antioxidant (made in [Tiba Specialty respectively, and it often kneaded with e 3 paint roll, and wes considered as base rasin. What added polymer. What added zero copy of minute hollow body was made into the comparative example 14, 20 copies of minute hollow bodies was made into working example 21, using (A-12) as an organic

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Using the mixture of 2-ethylhexanoio acid tin (Japanese east transformation make, U-28) (divalent) 3 weight section and amine (Wako Pure Chemical Industries make, jauryl amine) 0,75 weight section as a hardening agent, above-mentioned base resin and hardening agent were mixed uniformly, and workability (*******) and endurance were evaluated.

the comparative example 15, using (A-11) as an organic polymer.

he constituent of working example 21 had workability better than the comparative example 14, and its endurance was better than the comparative example 15.

(Working example 22 and comparative example 16)

earbonate (product made from Shiroishi oalcium, HOMATTON 88) 30 waight section, DOP40 weight section, DOP50 weight section, epocy specim plasticist (lew Jusina Offennical make, SANSO siese FE-92 90 weight section, thisocropic grant agent (made in I, Kusumoto Chemicala I, DSLD-PARON 80) 3 weight section, and a rom Shiraishi industry, Hakuenka CCR) 80 weight section, Surface treatment colloid celclum zarbonata (product made from Shiraishi Industry, BISUKO light R) 80 weight section. Heavy-calclum (Sankyo make, SANORULS770) 1 weight section, Ultraviolet ray absorbent (made in [Tiba Specialty RUGA NOx 1010) 1 weight section were measured, respectively, and it often kneaded with e 3 paint example 10, or the synthetic example 1, Surface treatment colloid calcium carbonate (product made made into working example 22, and what added 95 copies of (A-1) as an organic polymer was made roll, and was considered as base resin. What added 70 copies of (A-10) as an organic polymer was amine (Wako Pure Chemical Industries make, lauryl amine) 0.75 weight section was added, and the ethylhexanoic acid tin (Japanese east transformation make, U-28) (divalent) 3 weight section and Organic polymer (A-1) 95 weight section which has the reactive silicon group obtained in organic Chemicals], tinuvin 327) 1 weight section and antioxidant (made in [Tiba Specialty Chemicals], polymer (A-10) 70 weight section which has the reactive silloon group obtained in the synthetic photo-setting resin (the Toagosei make.) ARONIKKUSU M-3093 weight section, light stabilizer nto the comparative example 16. As a hardening agent, to this base resin, the mixture of 2recovery was measured to it.

The constituent of working example 22 showed the recovery higher than the comparative example 16. 0311

stopping weight % of an organic polymar low.

was considered as basa resin. What added five copies of epoxy resins was made into working example Epicoat 828), or five copies were measured, respectively, and it often kneaded with a 3 paint roll, and What added zero copy of epoxy resin was made into the comparative example 17. As a hardening agant, to this base resin, the mixture of 2-ethylhexanoic sold tin (Japanese east transformation made from Shiraishi industry. BISUKO light R) 60 weight section. Heavy-calcium-carbonate (product Chemicals], tinuvin 327) 1 weight section, Antioxidant (made in [Tiba Specialty Chemicals], IRUGA NOx 1010) I weight section and zero copy of epoxy resin (the product made from Japan epoxy resin, industry, Hakuenka CCR) 60 weight section. Surface treatment colloid calcium carbonate (product system plasticizer (New Japan Chemical make, SANSO sizer EP-S) 20 weight section, thixotropic grent agent (made in [Kusumoto Chemicals], DISUPARON 305) 3 weight section, and a photosetting resin (the Tosgosei make.) ARONIKKUSU M-3093 weight section, light stabilizer (Sankyo synthetic example 10, Surface treatment colloid caloium carbonate (product made from Shiraishi Organic polymer (A-10) 95 weight section which has the reactive silioon group obtained in the made from Shiroishi calcium, HOWAITON SB) 20 weight section, DOP40 weight section, epoxy make, SANORULS770) 1 weight section, Ultraviolet ray absorbent (made in [Tiba Specialty (Working example 23 and comparative example 17)

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naka, U-28) (divalent) 3 weight saction and amine (Wako Pure Chemical Industries make, lauryl amine) 0.75 weight section was added, and the recovery was measured to it.

he constituent of working example 23 showed the recovery higher than the comparative example 17.

Working example 24 and comparative example 18)

nade from Shiraishi industry, BISUKO light R) 60 weight section, Heavy-calcium-carbonate (product made from Shiroishi calcium, HOWAITON SB) 20 weight section, DOP40 weight section, epoxy RUGA NOx 1010) 1 weight section were messured, respectively, and it often kneaded with a 3 paint industry, Hakuenka COR) 60 weight section. Surface treatment colloid calcium carbonate (product system plasticizer (New Japan Chemical make, SANSO sizer EP-S) 20 weight section, thixotropic synthetic example 10. Surface treatment colloid calcium carbonate (product made from Shiraishi setting resin (the Toagosei make.) ARONIKKUSU M-3093 weight section, light stabilizer (Sankyo make, SANORULS770) 1 weight section, Ultraviolet ray absorbent (made in [Tiba Specialty Chemicals], thuyin 327) 1 weight section and antioxidant (made in [Tiba Specialty Chemicals]. grant agent (made in [Kusumoto Chemicals], DISUPARON 305) 3 weight section, and a photo-Drganic polymer (A-10) 95 weight section which has the reactive silicon group obtained in the oll, and was considered as base resin.

(divalent) 3 weight scotion and amine (Wako Pure Chemical Industries make, lauryl amine) 0.75 weight section as a hardoning agent was made into the comparative example 18. Base resin and a hardoning 2-ethylhexanolo acid tin (Japaneae east transformation make, U-28) (divalant) 3 weight section and oisacetylacetonate (the Japanese east -- transformation -- make.) The thing using the mixture of neo SUTAN U-220 0.1 weight section as a hardening agent is made into working example 24, The amine (the Wako Pure Chemical Industries maka.) lauryl amine 0.75 weight section and dibutyltin thing using the mixture of 2-ethylhexanoic acid tin (Japanese east transformation make, U-28) gent were mixed uniformly and the recovery and thin layer hardenability were evaluated. 0315

The constituent of working example 24 showed good thin layer hardenability rather than the comparative example 18, while the high recovery was shown. 0316

Synthetic example 13)

To the allyl end polyisobutylene obtained according to the example of manufactura of JP,H11-209639,A, under existence of Pt catalyst, it was made to react to triothoxysilane and the oolyisobutylene (A-13) which has a triethoxy sily group at the and was obtained

[0318] (Synthetic example 14)

To the allyl and polyisoburylens obtained in the synthatic example 13, under existence of Pt catalyst, it was made to react to methyl dimethoxyailane and the polyisoburylane (A-14) which has a methyl

dimethoxy silyl group at the end was obtained.

bissoetylacetonate (Japanese east transformation make, neo SUTAN U-220) duplexs was added, and To organic polymer (A-13, A-14) 100 weight section which has the reactive silicon group obtained in working example 25, and the thing using (A-14) was made into the comparative example 19. The hardened material of working example 25 showed the recovery higher than the comparative example the hardened material was obtained. The thing using (A-13) as an organic polymer was made into the synthetic example 13 and the synthetic example 14, the amount part of dibutyltin (Working example 25 and comparative example 19)

QuBr (4.2g) and acctonitrile (27.3g) were added to the reaction vessel with an agitator, and it stirrad for 15 minutes at 65 ** undar a nitrogen atmosphera. Acrylio acid n-butyl (100g), 2, 5-dibromo diethyl adipata (8.8g), and scatonitrila (16.6g) were added to this, and stirring mixing was improved. Synthetio example 15)

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Pentamethyl diethylenetriamine (0.17g) was added and the polymerization was made to start. Acrylio soid n-butyl (400g) was dropped continuously, heating and stirring at 70 **. Dividing addition of the riamine (0.68g) was carried out in the middle of dropping of acrylic sold n-butyl.

0 ** succeedingly, and the mixture containing the polymer which has an alkenyl group was obtained. **, 1,7-octadion (53.7g), scatonitrile (132g), and triamine (1.69g) were added, it heated and stirred at When monomer conversion reaches to 98%, after devolatilizing a ** monomer and ecetonitrile at 80

added to the methyloyolohoxane solution of the polymer to 100 copies of polymers, and it heated and Heating devolatilization of acetonitrile in a mixture and the unreacted 1,7-octadien was carried out, popies of KYO word 700SL [:] product [Both] made from Harmony Chemicals) of adsorbent was colymer (polymer [P1]) which has an alkenyl group by condensing a polymer solution was obtained. stirred under oxygen and nitrogen mixed gas atmosphere. Insoluble matter was removed and the sediment with a centrifuge, and was removed. Six copies (three copies of KYO word 500SH / 3 and it diluted with the methyloyolohexane. The insoluble polymerization catalyst was made to

100 copies of the polymer with 400 copies of methyloyclohexanes further and removing solid content, After having carried out heating devolatilization (10 or less torr of decompression degrees), diluting polymer [P2] was obtained. The number average molecular weight of this polymer [P2] was 24900, and molecular weight distribution was 1.36. The number of the alkanyl groups introduced par one stirring the obtained polymer [P1] at 180 ** for 12 hours, the solution was condensed and the molecule of polymers was 1.8.

were added in order, and it mixed, and heated and stirred at 100 ** under a nitrogen atmosphere for ethymyl)-1, 1 and 3, and 3-tetramethyl disiloxane (they are 1.5 mol equivalents to an alkenyl group) To this polymer [P2], methyl orthoformate (it is 1 mol equivalent to an alkenyl group), A platinum batalyst (it is 10 mg to 1 kg of polymers as an amount of platinum metal), 1-(2-trimethoxysily) 0.5 hour. It checked by 1H-NMR that the alkenyl group had disappeared by a reaction, and the

trimethoxyshyl group contant polymer (A-15) which condenses a reaction mixture and is made into the purpose was obtained. The number average molecular weight was 27900 and molecular weight distribution was 1.32. The number of the sily! groups introduced per one molecule of polymers was

Synthetic example 16)

ethyryD-1 used in the synthetic example 15, 1 and 3, and 3-terramethyl dislicxane. The number average molecular weight was 28600 and molecular weight distribution was 1.48. The number of the As opposed to the polymer [P2] obtained in the synthetic example 15, The triethoxy silyl group triethoxysilane (they are 3 mol equivalents to an alkenyl group) instead of 1-(2-trimethoxysilyl content polymer (A-16) was obtained like the synthetic example 15 excapt having used silyl groups introduced per one molecule of polymers was 1.5.

As opposed to the polymer [P2] obtained in the synthetic example 15. It is methyl dimethoxysilane (Synthetic example 17)

average molecular weight was 28400 and molecular weight distribution was 1.51. The number of the (to an alkenyl group.) instead of 1-(2-trimethoxysilyl ethynyl)-1 used in the synthetic example 15, 1 and 3, and 3-tetramethyl disiloxane. The methyl dimethoxy silyl group content polymer (A-17) was obtained like the synthetic example 15 except having used three mol equivalents. The number silyl groups introduced per one molecule of polymers was 1.5.

(Working example 26-28 and comparative example 20)

20 weight section, thanium oxido (jatihara Sangyo make, TIPAQUE R-820) 10 weight section, UDP80 weight section, tha amount part of thixotropic grant agent (made in [Kusumoto Chemicals]. CCR150 weight section and heavy calcium carbonate (the Maruo Calcium make.) 25ANANOKKUSU as opposed to organic polymer 100 weight section which has a reactive silicon group — surface treatment colloid calcium carbonate (the product made from the Shiraishi industry.) Hakuanka

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DSUPJARON (SERO) option: gift, tetabilitar (Selova made, SAVIDALIS,(SR)) visiglitat excitor and an elementary of the selovation of 13 weight section and an elementary of the selovation of 13 weight section and an elementary of the selovation of 14 weight section and elementary of the selovation of 14 weight section and elementary of the selovation of 14 between the SERO (Lawrell Selovation of 14 between the selovation of 14 between the SERO (Lawrell Selovation of 14 between the selovation of 14 between the SERO (Lawrell Selovation of 14 between the selovation of 14 between the SERO (Lawrell Selovation of 14 between the selovation of 14 between the SERO (Lawrell Selovation of 14 between the 14 be

example 20. [Industrial applicability] [0328]

The hardenability constituent of this invention is excellent in stability, endurance, and creep resistance,

Translation done.]